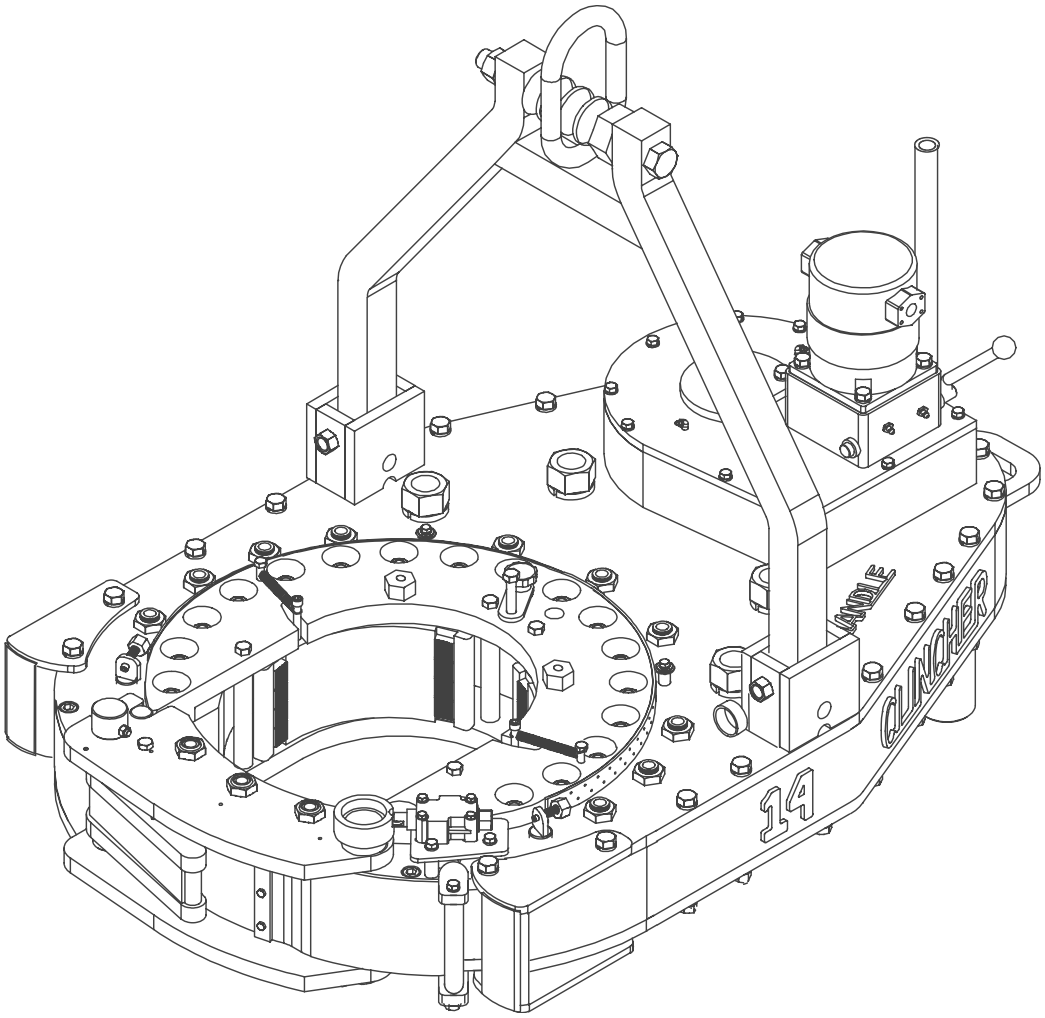
SUPERIOR
Manufacturing & Hydraulics

TECHNICAL MANUAL

14" CLINCHER® TONG



covers

TONG MODEL

CLE14000-08

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www.superior-manf.com

Published 12/2004

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This manual is not a controlled document and is subject to revision without notice. To receive updates and insure you have access to the latest information concerning the 14" **CLINCHER®** Tong, we request you complete this form and return the lower half to SUPERIOR Manufacturing and Hydraulics by mail or facsimile. Access to our manuals can also be acquired through our web site www.superior-manf.com. Select the tab '**CLINCHER®** Products', select the equipment from the list to get Specs page, select the tab 'Download Manual'.

Name: _____
Company: _____
Address: _____
Address: _____
City: _____ **State:** _____
Postal Code: _____ **Country:** _____
Telephone: _____ **Fax:** _____

Tong Model No.: _____ **Serial No.:** _____
Backup Model No.: _____ **Serial No.:** _____
Assembly Date: _____

- - - -

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14" CLINCHER® TONG

REVISION TABLE

Section	*Page*	*Date*	*Description*
Cover	Cover	06/2005	Revised Illustration; removed ISO emblem.
Title Pg	Title Pg.	06/2005	Removed ISO emblem.
3	6		
3	3-4	06/2005	Revised Jaw Range chart.
5	5	06/2005	Replaced PN for Shift Lever 45060 with Shift Assembly 45091.
7	1	06/2005	Revised Dovetail Jaw Size Ranges for Pins and Rollers.
9	1, 3, 4, 12 14, 28-30	06/2005	Added Illustration Dovetail Jaw Assy. 13 3/8" - 14 3/8". Revised Illustrations Tong Assembly, High Idler Gear Assy., Shift Gear Assy., Secondary Gear Assy., 7 5/8"-11 3/4" Low Friction Jaw Assy. & Dovetail Jaw Assy. 5" - 11 3/4"
11	1	06/2005	Added Acadiana Oilfield Instruments as supplier of information for Load Cells.
All	All	06/2005	Translated from English to Spanish.
Copyright	Copyright	02/2006	Added **CHROMEMASTER™**, **HYTOPS™**, Drillmaster, **GRIT FACE™** & Low Friction.
3	3-5	02/2006	Revised chart for CJDT14H jaws. Added chart for Splined Jaws.
7	1	02/2006	Revised Spare Parts List.
9	1, 25-30	02/2006	Added 14" Splined Jaw Assembly. Revised illustrations Valve Bank, LF Tong Jaw Assy. CJ-LF-14A, -14B & -14C, DT Jaw Assy's CJDT14H 5" – 12 3/4", DT Jaw Assy's CJDT14H 13 3/8" – 14 3/8".
13	9-12	02/06	Added Denison Dump Valve Illustration after tech. data on P/N 2070. Added Assy. of Dump Valve Electrical Connector.

14" CLINCHER® Tong

HAZARD WARNING

Nomenclature used in this manual:

WARNING	concerns an operating procedure or practice that, if not strictly observed, can result in injury to personnel or loss of life.
Caution	concerns an operating procedure or practice that, if not strictly observed, can result in damage to or destruction of equipment.
Note	concerns an operating procedure or practice that needs highlighting.

CLINCHER® Tongs are manufactured to provide a means of making up or breaking out high torque tubular connections. They utilize high pressure hydraulic fluid power which can cause the tong to move suddenly and with great force if the tong is not properly rigged up and operated. **CLINCHER®** Tongs contain rotating and reciprocating parts which can severely or fatally injure personnel who are operating, repairing, or near this equipment during its operation. **WARNING: Tongs are not to be operated by untrained personnel or personnel with diminished physical or mental capacity. No work of any type, including changing of dies, is to be carried out while the tong is connected to any hydraulic power unit.**

CLINCHER® Tongs are heavy tools. They should be suspended from a secure, high strength 7/8" IWRC minimum diameter wire cable with a 31 ton minimum breaking strength. The wire cable should be hung as close to the center of the wellbore as possible, without interfering with drilling equipment operation, to allow the tong to be readily swung into the working position. Vertical position control should be achieved by means of a **CLINCHER®** hydraulically operated lift cylinder/spring hanger. **WARNING: Users must insure the entire suspension system including cables, rig mounting points, lift cylinders, tong lifting brackets/bridles, winches, pulleys, counter weights, etc., are capable of handling the static weight of the tong plus any loads which could be transferred to it during the makeup or breakout process PLUS any shock loads which may be seen during operation. This system must readily allow downward movement equal to a minimum of the thread makeup distance to avoid overloading the suspension system and/or damage to equipment.**

A 1 1/4" IWRC minimum diameter wire cable with a 79.9 ton minimum or better breaking strength, should be attached at a 90 degree angle to the tong and at the same level to insure proper readout of torque indicator. A SNUBBING LINE should always be attached even when an integral backup is in use to provide additional safety in the event of a backup slippage. **WARNING: Users must provide a means of safely controlling the tong movements in all directions when it is in use. Failure to account for the its size, weight, movement and the amount of torque developed could result in personnel injury or death.**

14" CLINCHER® Tong

HAZARD WARNING

CLINCHER® Tongs utilize high pressure hydraulic fluids. Portions of the tong, control valves, hydraulic lines and cylinders may contain high pressure fluid even when the power unit is de-energized and the fluid supply hoses are disconnected. During normal operation the temperature of the hydraulic fluids as well as hoses, piping, valves, etc., can rise to a level which can cause burns. **WARNING: Personal protective gear including safety glasses, face shields, protective gloves and protective clothing must be worn to guard against the hazards of high pressure fluids. Tight fitting clothing is required to prevent entanglement in rotating components. These tools should be serviced by thoroughly trained and qualified hydraulic technicians using procedures to safely insure hydraulic pressure is bled from these circuits.**

The **CLINCHER®** Tong is equipped with a door interlock system which prevents tong rotation whenever the door is open. This system is to be tested before each mobilization and at every shift change. Should this system be determined to be inoperative, the tong is to be removed from service and tagged as ***in-operative*** until repairs are made. **CAUTION:** Operating the tong with the door in the open position could result in severe damage to the equipment and will void all manufacturer warranties. **WARNING: Operating the tong with the door open by means of a defective or bypassed door interlock system exposes the operator and nearby personnel to potentially fatal hazards.**

No attempt should be made to operate the **CLINCHER®** Tong for any purpose other than which it is intended. This system is capable of generating very large clamping forces and torsional loads which, if improperly applied or controlled, could result in damage to the tubular, to the tong or could possibly result in injury or death of personnel. Do not attempt to operate the unit without correct dies and the proper size tubular being in the tong. See Section 3 for more information concerning the selection and use of dies. **CAUTION: Operating this equipment without the correct size, type and orientation of dies can result in damage to the equipment or tubulars being handled.**

HYDRAULIC PRODUCT SAFETY

WARNING: Valve lever (spool) may "stick" (not center) under certain conditions allowing the hydraulic equipment to continue to operate and could cause serious injury, death or equipment failure.

VALVE SAFETY: Read and follow instructions carefully. Failure to observe instructions and guidelines may cause serious injury, death or equipment failure. A sticking valve (spool bind) may be caused by one or more of the following factors:

DIRTY OIL: Oil must be filtered to a minimum of 25 microns. Filters should be changed regularly - spin-on types after 50 hours of initial use and then after every two hundred fifty hours of use. Use of a condition indicator is recommended. Consult your tractor or implement owner's manual for filtration and changing recommendations for internal systems.

OIL REQUIREMENTS: Premium quality anti-wear type oil with a viscosity between 100 and 200 SSU at operating temperatures. Certain synthetic oils may cause spool seals to swell and the valve to stick. If in doubt, call CROSS Engineering.

IMPROPER HOOK UP OR MOUNTING: Always use the proper size fittings. Hook up "in" & "out" as noted on the valve body. Do not overtorque pipe fittings. Mounting surfaces should be flat and care should be used when tightening mounting bolts. Over-tightened bolts can cause spool bind and casting breakage. When hooking a valve in series, always use a power beyond sleeve. Consult your tractor or implement manual to make sure you have the proper quick disconnect line connected to the inlet of the remote valve.

MISAPPLICATION: Always use the proper valve for the job. CONVERTA, CD, CS or CA valves should never be used for metered heavy load lifting - loaders or similar applications. Use an open center valve for open center applications and a closed center valve for closed applications. If in doubt, check with your tractor dealer. Contact CROSS if the valve allows the hydraulic equipment to creep excessively.

MAINTENANCE: Make sure all bolts are tightened and torqued to the recommended specification. Bent or broken parts should not be used. Replace immediately. Always use exact replacements. Always protect valve spool from paint overspray.

Faulty quick disconnects can cause high back pressures and sticking spools. Check quick disconnects periodically to make sure they are functioning properly. If valve spool does not center or appears to stick, do not use!

PUMPS & MOTORS SAFETY:

A relief or bypass in your hydraulic system is necessary to prevent pump from breakage due to overpressurization. Use correct fittings and proper oil as noted in the technical service manual packed with each unit. Change oil as recommended by your implement or tractor manufacturer.

CYLINDER SAFETY:

Check clevis clearances before, during and after extending the cylinder and before using the cylinder under pressure to avoid possible injury, or bent or broken rods caused by binding. Never operatea cylinder above recommended pressures. Never use a cylinder as a safety device when trans-porting equipment.

PINHOLE LEAKS:

If you observe a pinhole leak, discontinue use of the component. If oil has penetrated your skin or contacted your eye, seek medical attention immediately!

DESCRIPTION and APPLICATION

The **CLINCHER®** Tong system is an "open-throat" design which can handle tubulars as small as 4 1/2 inches to as large as 14 inches in diameter. This system features two (2) jaws in the Tong which encircle the pipe. Wrap Around jaws and dies, combined with our low friction jaw technology and constant radial load cam system provide exceptional gripping capabilities with reduced pipe deformation, stress, and marking. Using our non-marking aluminum die system or **GRIT FACE™** dies in the Tong will now allow stainless steel corrosion resistant alloys (CRA) to be run as quickly and easily as a traditional tong runs conventional steel tubulars.

Notable Features and Benefits

Low Friction Jaws	increases cam angle efficiency to allow use of aluminum dies
Splined Die System	aligns the die with the tubular and more evenly distributes radial load, essentially wrapping the die around the tube reduces pipe stress, deformation, and minimizes marking
Constant Cam Angle	insures an adequate radial load is available regardless of relative rotation to enhance performance on undersized pipe
Die Retention Method	provides an enhanced method of preventing equipment damage and die loss if the pipe is inadvertently moved while the tong is still gripping the pipe
Self Adjusting Brake	eliminates need to manually adjust brake bands to compensate for normal wear

In addition to these unique features listed above, the **CLINCHER®** Tong System is also equipped with numerous standard features including:

Door Interlock	prevents tong ring gear rotation whenever the tong door is open but allows control and operation of the lift cylinder at all times
Encoder Adapter	accepts customer's turns encoder to signal to a torque/turn computer
Pressure Control Valve	adjustable pressure control valves allow the customer to limit the amount of pressure applied and torque developed

The features described above are covered by US and foreign patents or pending US and foreign patents.

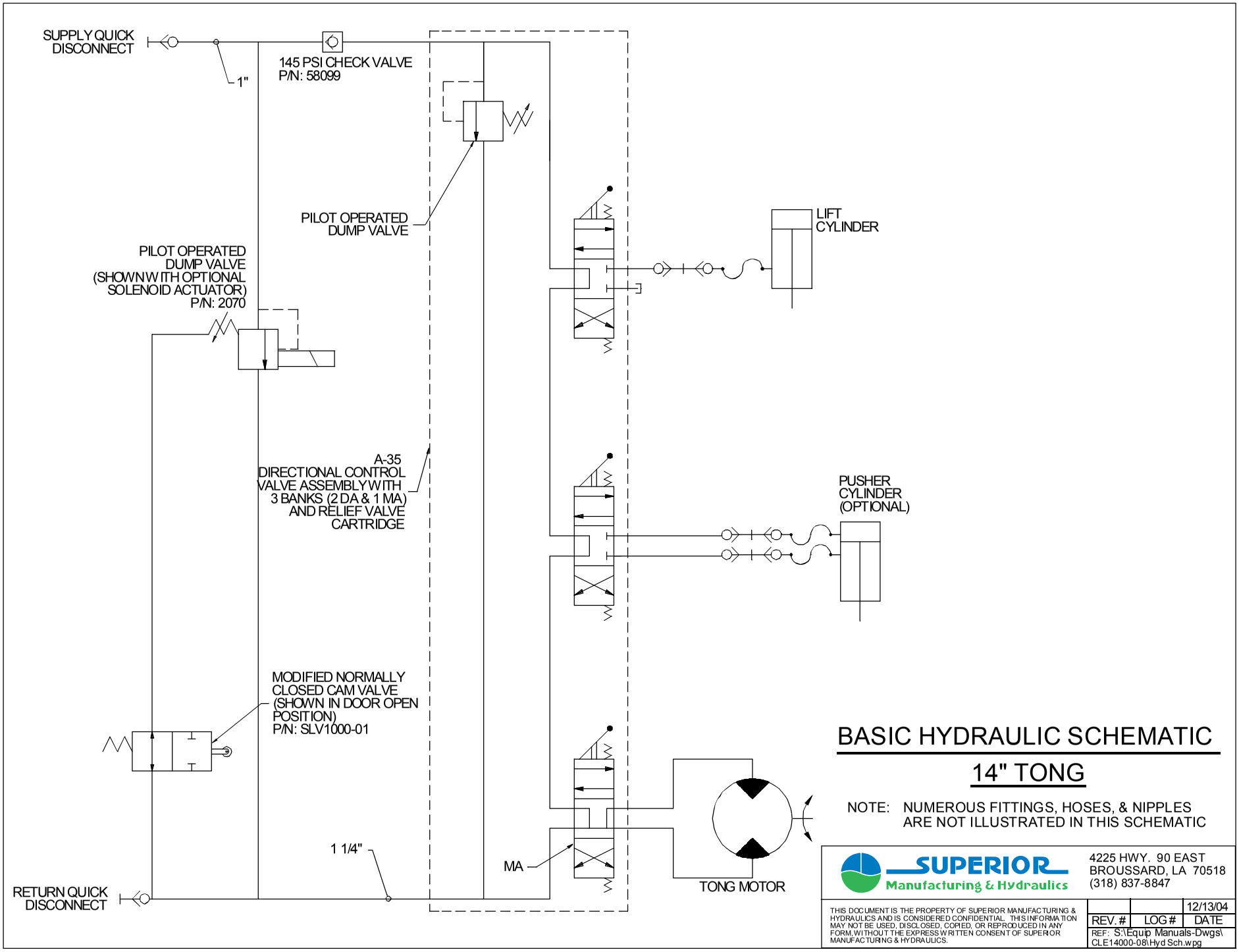
SPECIFICATIONS

Maximum Torque	50,000 ft.lbs. / 67,791 Nm
Maximum Operating Pressure	2,500 psi / 172 bar
RPM @ 60 GPM/227 LPM: Manual	
High	40
Low	6
Handle Length Tong	40.0" / 101.6 cm
Overall Length	62.0" / 157.5 cm
Overall Width including Name Plates	36.0" / 91.4 cm
Overall Width including Tong Legs	45.5" / 115.6 cm
Overall Height w/o Backup	28.0" / 71.1 cm
Weight/Tong	2,200 lbs. / 998 kg
Jaw Capacity	4 1/2" thru 14"

Operates using Dovetailed Strip Dies, Steel Tooth Wrap Around Dies, **GRIT FACE™** Wrap Around Dies, and Aluminum Wrap Around Dies.

Standard Equipment:
- Door Interlock
- Self Adjusting Brake
- Bail Assembly

Optional Equipment:
- Two Speed Hydraulic Motor
- Electronic Solenoid Dump Valve
- Shipping Stand, or Skid


SUPPLY QUICK DISCONNECT
1"
145 PSI CHECK VALVE P/N: 58099
PILOT OPERATED DUMP VALVE
PILOT OPERATED DUMP VALVE (SHOWN WITH OPTIONAL SOLENOID ACTUATOR) P/N: 2070
A-35 DIRECTIONAL CONTROL VALVE ASSEMBLY WITH 3 BANKS (2 DA & 1 MA) AND RELIEF VALVE CARTRIDGE
LIFT CYLINDER
PUSHER CYLINDER (OPTIONAL)
MODIFIED NORMALLY CLOSED CAM VALVE (SHOWN IN DOOR OPEN POSITION) P/N: SLV1000-01
1 1/4"
MA
TONG MOTOR
RETURN QUICK DISCONNECT

BASIC HYDRAULIC SCHEMATIC

14" TONG

NOTE: NUMEROUS FITTINGS, HOSES, & NIPPLES ARE NOT ILLUSTRATED IN THIS SCHEMATIC

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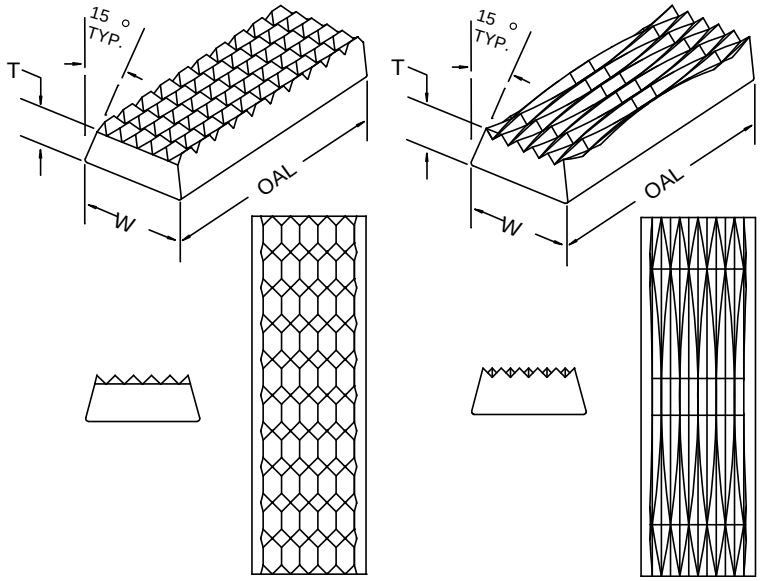
CLINCHER® DIES

Many **CLINCHER®** Tongs and Backups utilize jaws and/or adapters which accept Dovetail Inserts (AKA Pencil Dies or Strip Dies) to effectively grip tubulars. Jaw systems and jaw adapters are also available which accommodate Wrap-Around Fine Tooth Steel Dies, **GRIT FACE™** Dies and Aluminum Dies.

The appropriate jaws, die adapters and dies required for a specific tubular OD are also described in this section of the manual.



STRAIGHT TOOTH **DIAMOND TOOTH**

Note: Diamond Tooth Dies are used when a more aggressive bite is required.

Thickness	Width	OAL	P/N Straight Tooth	P/N Diamond Tooth
5/16	5/8	3 1/2	★	★
5/16	5/8	3 7/8	DTI4052	★
5/16	5/8	4 1/2	DTI4002	★
3/8	5/8	3 1/2	DTI4030	★
3/8	5/8	3 7/8	DTI4051	★
3/8	5/8	4 1/2	DTI4001	★

Thickness	Width	OAL	P/N Straight Tooth	P/N Diamond Tooth
17/32	5/8	3 1/2	DTI4031	★
17/32	5/8	3 7/8	DTI4053	★
17/32	5/8	4 1/2	DTI4003	★
5/8	5/8	3 1/2	DTI4032	★
5/8	5/8	3 7/8	DTI4054	★
5/8	5/8	4 1/2	DTI4004	★
11/16	5/8	3 7/8	DTI4055	★
11/16	5/8	4 1/2	DTI4005	★
3/8	1	3 7/8	DTI1505	★
3/8	1 1/4	3 7/8	DTI1614	★
3/8	1 1/4	5	DTI1610	★
7/16	1 1/4	3 7/8	DTI1612	DTI1612D
7/16	1 1/4	5	DTI1617	DTI1617D
1/2	1 1/4	3 7/8	DTI1601	DTI1601D
1/2	1 1/4	5	DTI1602	DTI1602D
9/16	1 1/4	3 7/8	DTI1622	DTI1622D
9/16	1 1/4	5	DTI1623	DTI1623D
5/8	1 1/4	3 7/8	DTI1632	DTI1632D
5/8	1 1/4	5	DTI1633	★
11/16	1 1/4	3 7/8	DTI1642	★
11/16	1 1/4	5	DTI1646	★
3/4	1 1/4	3 7/8	DTI1651	★
3/4	1 1/4	5	DTI1693	★
3/4	1 1/4	5 7/8	DTI1662	DTI1662D
13/16	1 1/4	3 7/8	DTI1661	★
13/16	1 1/4	5	DTI1664	★
7/8	1 1/4	3 7/8	DTI1671	★
7/8	1 1/4	5	DTI1673	★
1	1 1/4	3 7/8	DTI1691	★
1	1 1/4	5	DTI1697	★

★ Available upon request.

CLINCHER® WRAP AROUND DIES

CLINCHER® Wrap Around Dies are available in three types:

Fine Toothed Steel Dies:	for low to ultra high torque applications on carbon steel tubulars including tubing, casing, and drill pipe
Smooth Faced Aluminum Dies:	for low to moderate torque applications on fiberglass and corrosion resistant alloy (stainless steel) tubulars
GRIT FACE™ Dies:	for low to high torque applications on fiberglass and corrosion resistant alloy (stainless steel) tubulars where the use of steel dies is prohibited as well as on carbon steel tubulars where reduced marking is desired

CLINCHER® Dies are designed to match the OD of the tubing, casing, coupling, or accessory being made up or broken out. Each die is stamped on the top or side to identify its size. Using Fine Toothed Steel Dies which are slightly larger than the tubular is acceptable provided the difference in diameters is less than 3/32" (0.093"). Aluminum and **GRIT FACE™** Dies should be matched with the specific tubular diameters required. **Note:** The use of improperly sized dies can result in reduced torque capacity, increased pipe marking, and reduced die life.

CAUTION: Do not attempt to grip tubular diameters which are larger than the dies being used. Failure to observe this precaution can result in damage to the tubular or tong jaws.

In emergencies where correct die sizes are unavailable, some operators have successfully used two different sizes of dies to accommodate unusual, nonstandard diameters.

CLINCHER® Wrap Around Dies are manufactured in specific diameters to match standard tubing and casing diameters, API coupling diameters, selected work string connection diameters and certain commonly used premium connection coupling diameters. **CLINCHER®** Wrap Around Dies should not be used on tubulars which are larger than the nominal die size. Steel Toothed Dies can be used on tubulars which are no smaller than 3/32" (0.093") less than the nominal die size. Aluminum and **GRIT FACE™** Dies should be matched with the specific tubular diameters required.

Note: Fine Toothed Steel Dies are normally stocked in our Broussard, Louisiana facility. A partial listing of commonly manufactured sizes is shown below. Aluminum and **GRIT FACE™** Dies are normally made to order although a limited range of sizes and small quantities may be available from stock. Contact SUPERIOR Manufacturing & Hydraulics for information concerning availability of stock and special die sizes.

CLINCHER® WRAP AROUND DIES

Typical Wrap Around Die Nomenclature for CLE14000 CLINCHER® Tong
Jaws Size 14" x 10 3/4"

BUC 10750-xxxx Fine Toothed Steel Dies for jaws (2 reqd per tong)

BUCA 10750-xxxx Aluminum Dies for jaws (2 reqd per tong)

BB 10750-xxxx **GRIT FACE™** Dies for jaws (2 reqd per tong)

ORDERING EXAMPLE: Fine Toothed Steel Dies are needed to run 8 5/8" OD tubing,
Qty. two (2) BUC 10750-8625 dies for jaws
(replace xxxx with size reqd in inches)

BUC 10750-xxxx: Fine Toothed Steel Dies for Tong
8.625 9.625 10.750

BUCA 10750-xxxx: Aluminum Dies for Tong
8.625 9.625 10.750

BB 10750-xxxx: **GRIT FACE™** Dies for Tong
8.625 9.625 10.750

Contact SUPERIOR Manufacturing & Hydraulics for information concerning availability of stock and special die sizes.

Gripping Diameter as a Function of Die Thickness

Nominal Jaw and Dovetail Die Adapter Size	Jaw Assembly Part Number assembly consists of two jaws c/w pins and rollers	dovetail jaw part number	nominal jaw size	Jaw gripping range when dressed with 1 1/4" wide xx.xx" long dovetail strip dies with thickness of:							
				0.8125 13/16 undersized	0.75 3/4 undersized	0.6875 11/16 undersized	0.625 5/8 undersized	0.5625 9/16 undersized	**0.5 1/2 STANDARD**	0.4375 7/16 oversized	*<<dovetail die thickness* *<<pipe application*
14 x 14.375	CJDT14H14375	14H14375L & 14H14375R	14.375	13.750	13.875	14.000	14.125	14.250	**14.375**	14.500	maximum pipe OD for die & jaw
14 x 14	CJDT14H14000	14H14000L & 14H14000R	14.000	13.375	13.500	13.625	13.750	13.875	**14.000**	14.125	maximum pipe OD for die & jaw
14 x 13.625	CJDT14H13625	14H13625L & 14H13625R	13.625	13.000	13.125	13.250	13.375	13.500	**13.625**	13.750	maximum pipe OD for die & jaw
14 x 13.375	CJDT14H13375	14H13375L & 14H13375R	13.375	12.750	12.875	13.000	13.125	13.250	**13.375**	13.500	maximum pipe OD for die & jaw
14 x 12.750	CJDT14H12750	14H12750L & 14H12750R	12.750	12.125	12.250	12.375	12.500	12.625	**12.750**	12.875	maximum pipe OD for die & jaw
14 x 12	CJDT14H12000	N/A	12.000	11.375	11.500	11.625	11.750	11.875	**12.000**	12.125	maximum pipe OD for die & jaw
14 x 11.750	CJDT14H11750	14H11750L & 14H11750R	11.750	11.125	11.250	11.375	11.500	11.625	**11.750**	11.875	maximum pipe OD for die & jaw
14 x 10.75	CJDT14H10750	14H10750L & 14H10750R	10.750	10.125	10.250	10.375	10.500	10.625	**10.750**	10.875	maximum pipe OD for die & jaw
14 x 10.625	CJDT14H10625	14H10625L & 14H10625R	10.625	10.000	10.125	10.250	10.375	10.500	**10.625**	10.750	maximum pipe OD for die & jaw
14 x 10.25	CJDT14H10250	N/A	10.250	9.625	9.750	9.875	10.000	10.125	**10.250**	10.375	maximum pipe OD for die & jaw
14 x 9.875	CJDT14H09875	14H09875L & 14H09875R	9.875	9.250	9.375	9.500	9.625	9.750	**9.875**	10.000	maximum pipe OD for die & jaw
14 x 9.625	CJDT14H09625	14H09625L & 14H09625R	9.625	9.000	9.125	9.250	9.375	9.500	**9.625**	9.750	maximum pipe OD for die & jaw
14 x 8.625	CJDT14H08625	14H08625L & 14H08625R	8.625	8.000	8.125	8.250	8.375	8.500	**8.625**	8.750	maximum pipe OD for die & jaw
14 x 7.625	CJDT14H07625	14H07625L & 14H07625R	7.625	7.000	7.125	7.250	7.375	7.500	**7.625**	7.750	maximum pipe OD for die & jaw
14 x 7	CJDT14H07000	14H07000L & 14H07000R	7.000	6.375	6.500	6.625	6.750	6.875	**7.000**	7.125	maximum pipe OD for die & jaw
14 x 6.625	CJDT14H06625	14H06625L & 14H06625R	6.625	6.000	6.125	6.250	6.375	6.500	**6.625**	6.750	maximum pipe OD for die & jaw
14 x 5.5	CJDT14H05500	14H05500L & 14H05500R	5.500	4.875	5.000	5.125	5.250	5.375	**5.500**	5.625	maximum pipe OD for die & jaw
14 x 5	CJDT14H05000	14H05000L & 14H05000R	5.000	4.375	4.500	4.625	4.750	4.875	**5.000**	5.125	maximum pipe OD for die & jaw
***CLINCHER®** part number for Straight Tooth Dovetail Dies>>*				*DTI1664*	*DTI1693*	*DTI1646*	*DTI1633*	*DTI1623*	***DTI1602***	*DTI1617*	
***CLINCHER®** part number for Diamond Toothed Dovetail Dies>>*								*DTI1623D*	***DTI1602D***	*DTI1617D*	

Splined jaws and splined wraparound dies for CLINCHER® 14" Casing Tong

Nominal wraparound tong jaw size	Splined Jaw Assembly Number *assembly consists of two jaws c/w pins, rollers, clips and clip bolts*	splined jaw roller part number *two pcs reqd per set*	splined jaw pin part number *two pcs reqd per set*	top clip part number for tong jaws *two pcs reqd per set*	bottom clip part number for tong jaws *two pcs reqd per set*	available wraparound die series (two dies are required to dress tong jaws - excludes any dies required for couplings)		
						fine tooth steel dies for tong	**GRIT FACE™** dies for tong	non-marking aluminum dies for tong
14 x 7 5/8 - 4 1/2	CJ-LF-14A	14031-02 w/ Bushing 22DU24	14063	72033	72033	BUC7625-nnnnn	BB7625-nnnnn	BUCA7625-nnnnn
14 x 10 3/4 - 7 5/8	CJ-LF-14B	14062 w/ Bushing 22DU24	14063	BUCS10707	BUCS10707	BUCM1075-nnnnn	BB1075-nnnnn	BUCA1075-nnnnn
14 x 11 3/4 - 7 5/8	CJ-LF-14C	14062 w/ Bushing 22DU24	14063	CLEBU1121	CLEBU1121	CLEBU1175-nnnnn	BB1175-nnnnn	BUCA1175-nnnnn
14 x 14 - 10 3/4	CJ-14A	14059-01	76013-01	14618	14618	CLE1400-nnnnn	BB1400-nnnnn	N/A

-nnnnn indicates size be designated by replacing "nnnnn" sequence with size required (in inches) to three decimal places; i.e., 4.500 for 4 1/2" OD casing.

Note: **CLINCHER®** wraparound dies are machined to specific casing, tubing, coupling or accessory diameter. Additional dies must be orderd to match specific coupling diameters associated with accessories or special clearance premium tubular connections.

ASSEMBLY TORQUE REQUIREMENTS

FASTENER LUBRICATION AND MAKE UP TORQUE REQUIREMENTS

Most bolts, nuts, and other threaded components are to be lubricated with Never-Seez or equivalent before assembly. Certain fasteners are to be assembled using permanent or removable Loctite as indicated in the assembly instructions. All tapered pipe threads are to be treated with a Teflon based pipe dope to assist in makeup and prevent leakage.

CAUTION: Do not use teflon tape. Improper application of teflon tape can cause joint failures. Teflon tape can release large particles which can plug small passages in hydraulic equipment.

All standard fasteners used in **CLINCHER®** products are to be GRADE 8 or better. DO NOT SUBSTITUTE lesser grades of fasteners. All fasteners are to be made up to the torque charted below. Failure to properly assemble these fasteners can result in their loss, product malfunction, and ultimately result in situations where personnel can be exposed to dangerous situations.

TONG FASTENERS		
Size	***Application***	***Torque***
1/4 - 20 NC	door switch mounting bolts	10 ft lbs
3/8 - 16 NC	tong plates, shift assy., door switch, clip bolts	33 ft lbs
1/2 - 13 NC	motor mounts, cage plate spacer bolts, bearing caps, ring gear key, locking pin, brake bands, valve bank mounting bolts	93 ft lbs
5/8 - 11 NC	top and bottom tong plates, bearing caps	180 ft lbs
3/4 - 10 NC	bail bolts	317 ft lbs
7/8 - 14 NF	cam follower allen head nuts	63 ft lbs
1 - 8 NC	bail bolts	100 ft lbs
1 - 12 NF	dumbell roller	*
1 1/2 - 12 NF	idler shaft	1,200 ft lbs

* Tighten until all slack is removed, but dumbell roller is still free to rotate by hand.

LUBRICATION STANDARDS

Bearings and gears must be lubricated to minimize friction, cool, exclude foreign matter, and prevent corrosion. **CLINCHER®** recommends using Texaco Marfak MP 2 or equivalent for all grease zerts, roller bearings, and bushings. Gears located within the clutch housing or between the tong plates are to be heavily lubricated using PLUSCO 855 or equivalent.

OPERATION

Suspension

A) Tong should be hung by 7/8" IWRC minimum O.D. wire cable with a 31 ton minimum breaking strength. It should be hung as close to the center of the drill rotary without interfering with operation of drill string and lifting equipment. It is recommended the operator make use of the **CLINCHER®** Lift Cylinder. The **CLINCHER®** Lift Cylinder incorporates a hydraulic cylinder and manual lift spring. The hydraulic cylinder portion is used to assist in the raising and lowering of the tong and backup while the spring allows for movement during make-up and break-out.

WARNING: The suspension system must allow the tong to easily move down a distance equivalent to the thread make-up length. If significant resistance is encountered the suspension system may be subject to load which could cause its failure, damage equipment, or expose personnel to severe or fatal hazards.

B) Assure that the tong is suspended in level manner. Both tong and backup must be level at the point they contact the tubular. Using adjustment screws and slots in rigid hanger assembly, adjust tong so that it hangs level on horizontal axis and is parallel to tubular on vertical axis. If using 3 point bridle, use turnbuckles to adjust tong so it hangs level.

C) Make certain that floor space is adequate to maneuver tong on and off pipe. The space must be clear of obstructions to allow safe and unrestricted operation.

D) Attached 1 1/4" IWRC minimum wire cable with a 79.9 ton minimum or better breaking strength, as a tong back up line at 90 degree angle to tong and at the same level to insure proper readout of torque indicator. You should always have snubbing line attached. Use of a integral hydraulic backup is safer than manual backup, but operators should maintain additional safety of snubbing line to prevent injury in case of hydraulic failure or the failure of operator to have backup properly applied to tubular. This equipment generates extreme torque and should be used with caution.

Jaw and Wrap Around Die Installation

A) Be sure all power to unit is off, and power unit is shut down. Disconnect hydraulic hoses.

B) Determine O.D. of tubular to be made-up or broken-out. Use proper dies to bite O.D. of tubular and insert as follows: Remove jaw assembly from tong. Remove upper die retainer clips. Insert die into jaw. Reinstall clips and clip retainer bolts. Reinstall jaws into cage plates, install pivot pins and reattach springs.

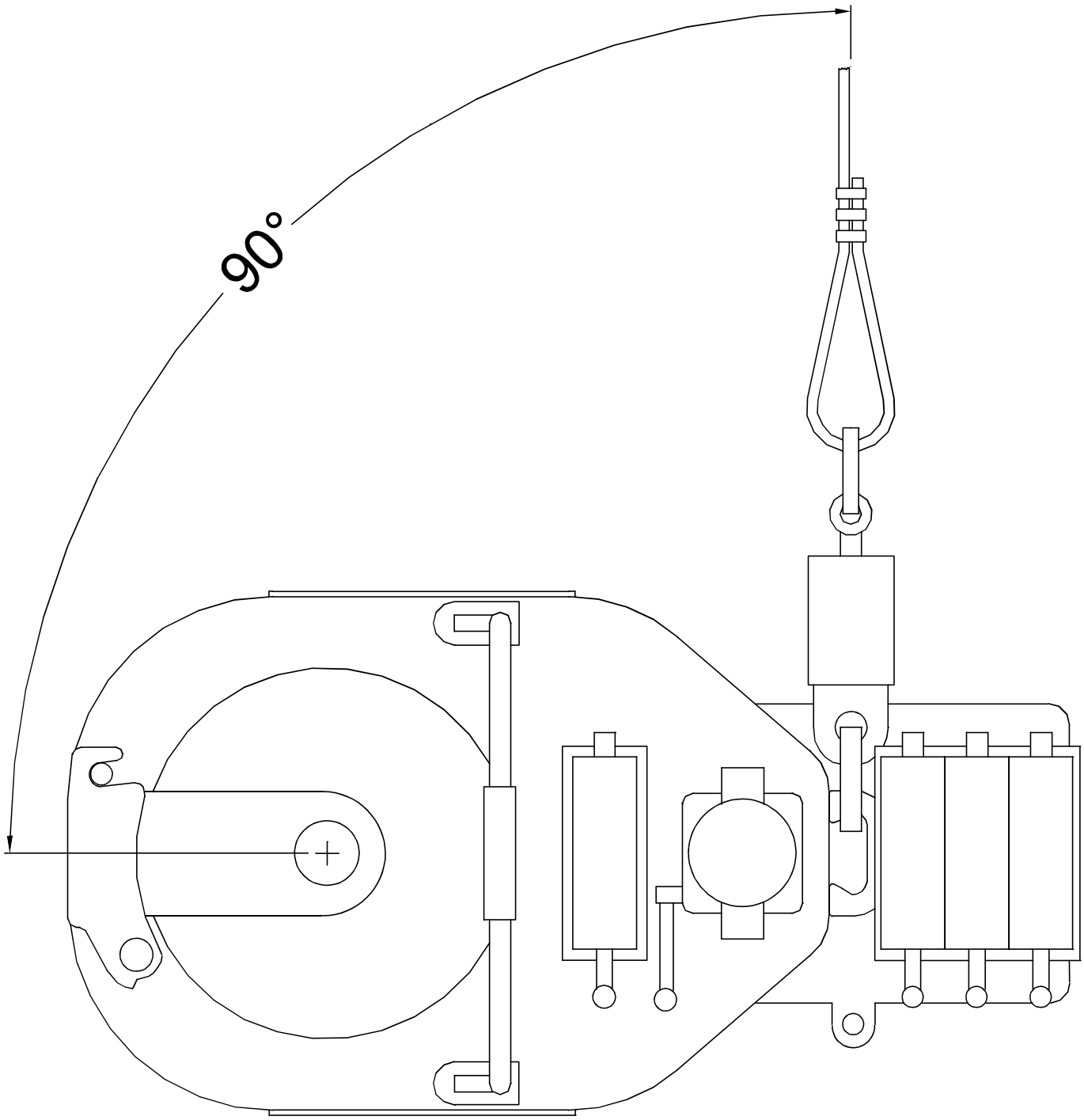
OPERATION

Hydraulic Lines

A) Be sure all power to unit is off, and power unit is shut down.

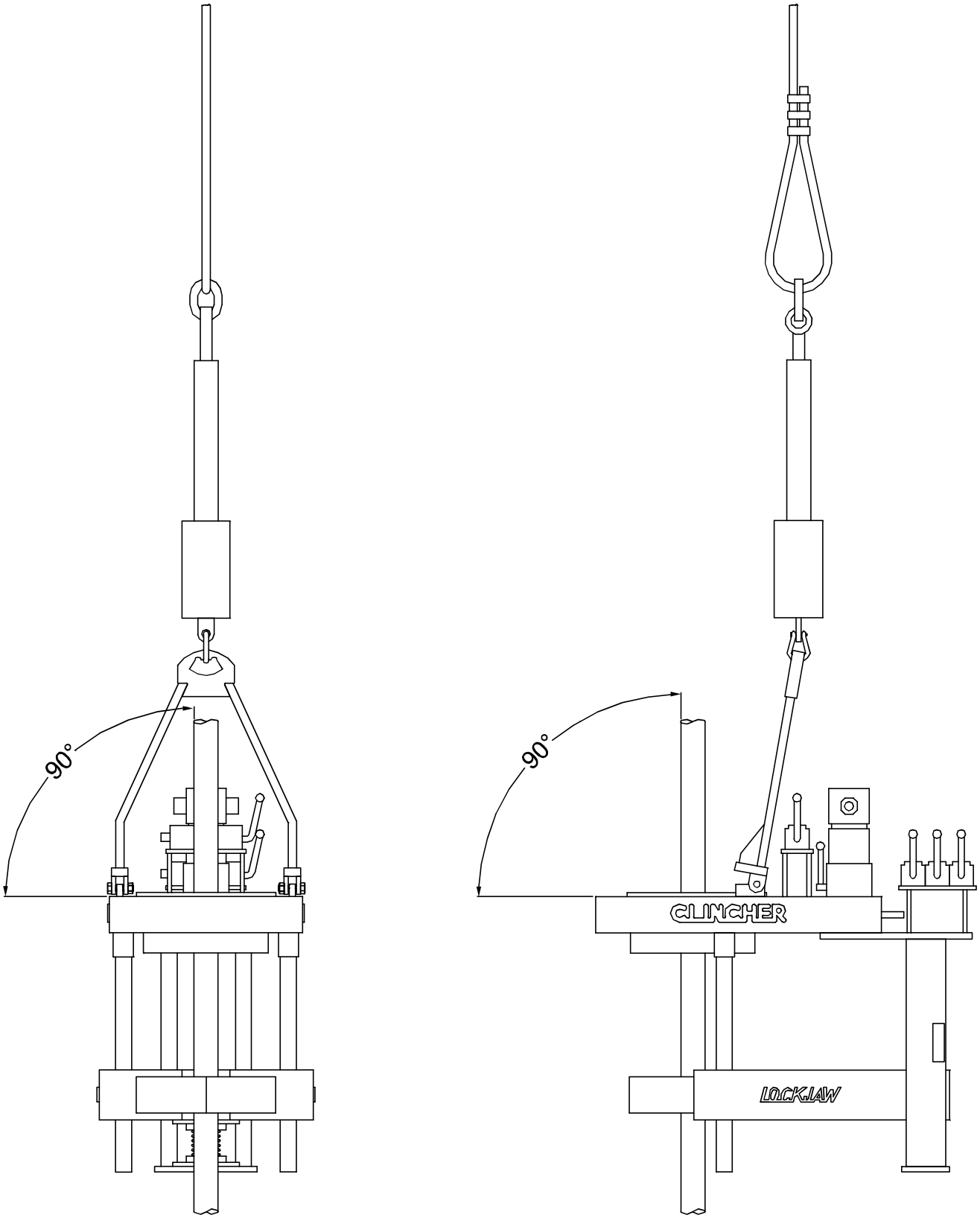
B) Always inspect hoses prior to installation for abrasions, kinks, and other visible damage.

C) Install hydraulic supply hose and hydraulic return hose between tong and hydraulic power unit. Be advised that the standard installation on **CLINCHER®** tong calls for 1" Hydraulic Supply hose and 1-1/4" Hydraulic Return hose. The differing hoses eliminates the possibility of attaching the wrong hose to the wrong outlet while at the same time reducing back pressure in your hydraulic system.



TYPICAL SNUB LINE INSTALLATION

NOTE: SNUB LINE IS PERPENDICULAR
TO AXIS OF TONG



TYPICAL TONG INSTALLATION

NOTE: TONG IS PERPENDICULAR
TO TUBING

OPERATION

Tong Operation

A. Insure proper dies are installed. Connect hydraulic hoses, verify reservoir is full of hydraulic fluid and insure suction valve is open.

B. Open bypass valve to hydraulic system, then check to make sure all hose connections are secure and hydraulic system is free of leaks.

C. Be certain door is completely closed before operation to insure safe operation. The **CLINCHER®** CLE14000 is equipped with a door switch, which prevents operation of the tong when door is even partially open.

D. Use power unit to start up procedure as outlined in your owners manual supplied by the manufacturer.

E. In the event hoses are not tightened securely, possible failures to hydraulic system can occur.

   1) If pressure supply hoses are restricted or flow is blocked, pressure will increase in the hydraulic power unit, resulting in increased RPM in the power unit.

   2) If return line hoses are restricted or flow is blocked, pressure will increase in the hydraulic power unit and the hydraulic system to the tong itself, resulting in the tong motor increasing to maximum pressure and possible motor seal failure.

F. After completion of A through E restart the power unit and allow engine to idle for approximately 10 minutes. Slowly close bypass valve to allow circulation of hydraulic oil through tong and hoses. Place shifting lever into low and rotate several times. Repeat in reverse. If correct jaw-die combination is installed, the unit is now ready to run pipe.

G. Adjust height of tong to proper height, using the control valve located all the way to the right of rear valve bank assembly.

H. Stand in the normal operators position, insert the locking pin into the rear cage plate hole (on operators side). This pin allows ring gear to rotate clockwise (make-up) and engage the can to close jaws on pipe.

I. Rotate ring gear clockwise by pushing motor control lever on the front valve bank assembly forward until jaws lock on pipe and continue to rotate until desired amount or torque is applied.

J. After correct amount of torque specific to that connection has been applied, release tong jaws by pulling back on motor control lever until jaws release and throat in cage plate is aligned with door opening. Open door.

K. High and low gear is adjusted by use of Shift Assembly PN 45091, located to the left side of the shifting housing. With the lever in the upwards position the tong is in high gear. With the shifting lever in the downward position, the tong is in low gear.

OPERATION

Tong Operation

After completing the makeup or breakout cycle the jaws are opened by reversing the tong motor to drive the ring gear and cam surfaces in the opposite direction until the reversing pin contacts the ring gear shoulder. Springs are used to return the jaws to their fully open position.

The Tong's cage plate braking system is self adjusting to compensate for brake band wear. Field adjustments are not required under normal conditions.

MAINTENANCE

CLINCHER® recommends that owners of **CLINCHER®** Hydraulic Power Tongs, **CHROMEMASTER™**s, and accessories adapt a regularly scheduled maintenance program. Implementation of this type of program offers several benefits. First you increase the life of your equipment, secondly, you may find a problem before it escalates to a costly repair or down time on the job, and most important, prevent injury to operating personnel.

A major inspection (described at the end of this section) should be carried out if equipment is suspected to have been damaged during transit or is to be mobilized to a remote location where maintenance operations are difficult to carry out.

Routine Maintenance

Cleaning - Upon return from each and every job:

A) Pre-wash unit to remove majority of dirt and grease build up as to allow removal of dies, and inspection of overall condition of unit.

B) Remove and inspect dies from tong. Note any missing or damaged die retainers and/or die retainer bolts.

C) Remove side jaws from tong and inspect side jaw for missing or broken parts, damaged splines, broken ears (locking hooks on front portion of side jaws).

D) Clean and inspect side jaws, jaw pins, jaw rollers for damage or excessive wear. Lubricate pins and rollers, and reinstall in tong.

E) Inspect hanger and all hoses for wear, replace as necessary.

F) Inspect hanger assembly to assure all parts are returned and in operating condition. (*i.e.* H-Plates, spring, leg springs, leg spring caps and pins)

G) Replace jaw pins and rollers in tong.

H) Lubricate tong's cam followers (upper and lower), dumbell roller shafts (upper and lower zerts), door shaft, center idler gear shaft, outboard idler gear shafts (4), pinion gear and secondary gear assemblies (Pinion gear and secondary gear assemblies are installed with sealed bearings. There are no provisions to grease these bearings. However, if replaced by non-sealed bearings, the 1/8" NPT flush plugs should be replaced with zerts PN 1001 and both gear assemblies should be added to the regular lubrication schedule.), low gear housing, and shift housing (2 zerts each), and re-pack tong body cavity.

I) Install dies of a size needed for testing purposes, and attach hydraulic power unit to tong. Before energizing power unit make certain no one is working on tong and all tools and parts are removed from the tong.

MAINTENANCE

J) With the proper dies installed in the tong, place reversing pin into the make-up position, set tong into low gear and operate tong through several cycles of locking, biting, and torqueing to required torque. Change reversing pin to break-out position and repeat. Repeat same procedure in high gear.

Note: Torque developed in high gear is considerably less than torque developed in low gear.

K) Test door interlock system by opening door slightly with tong rotating. (Remove test mandrel for this procedure.) The tongs rotation should stop. If tong rotation fails to stop, close door, cease rotation, deactivate power unit, and inspect door interlock switch for damage. Insure that adjustment collar is oriented to allow wheel of door switch to fit into recess on collar.

Warning: If door switch system is not functioning properly tong must not be used.

L) Reinspect tong hydraulic system for leaks.

M) If at this time the unit is functioning as intended, replace all covers and grease splines in tong, tape or grease spools on control valves (to prevent paint from adhering to polished spool surface), prime and paint unit for storage.

MAINTENANCE

Recommended Lubrication Schedule Performed after Completion of Each Job

Hydraulic Tong

A) Cam followers: upper and lower (all)
B) Dumbell roller shafts: upper and lower (all)
C) Door shaft
D) Center idler shaft
E) Outboard idler shaft (4)
F) Low gear housing (3 zerts)
G) Shift housing (2 zerts)
H) Re-pack tong cavity
I) Pinion and secondary gear shafts (if sealed bearings have been replaced by non-sealed bearings)
J) Jaw rollers and pins. Remove jaw pins and rollers, clean and lubricate with gear grease.
K) Inspect hydraulic fluid for foreign material and contaminants. Filter or replace. You must filter or replace entire system including power unit tank and lines along with tong to insure all contaminants are removed.

Annual Major Maintenance

Inspection and Repair

Routine preventative maintenance will significantly extend the operating life of your equipment, reduce operating cost and avoid downtime. **CLINCHER®** recommends a program of frequent routine inspection, and if equipment is suspected to have been damaged during transit or is to be mobilized to a remote location where maintenance operations are difficult to carry out, perform the following:

A) Visually inspect components on power tong which could possibly have been damaged either during operation or transit. *i.e.* Damage to hanger assembly, mounting legs, or hydraulic valve assembly.

B) Check test date. Ensure that a load test and inspection was carried out within the last 9 months.

C) Check ring gear. Check for any signs of damage or wear.

D) Remove motor and valve assembly from tong body.

E) Check motor seal. Apply hydraulic power, run motor and visually check motor seal for any signs of leakage.

F) Check drive gear, high and low pinion gears. Check for excessive sign of wear on motor gear.

G) Check condition of control valve spools. Activate valves and check for any sign of wear, pitting, or scoring of the chrome surface of spools. If spool is damaged in any way, the complete section must be changed out. Spools are not interchangeable.

MAINTENANCE

H) Check gear selector and shaft. Visually inspect shifting shaft for alignment and straightness.

I) Check Hi/Low Gear assembly. Visually inspect high and low clutch and gears for any sign of chipped, broken, or worn teeth.

J) Check dumbell rollers, shafts, and bushings. Check for excess movement on either bearings, bushings, shafts, or dumbells.

K) Check idler gears and center pinion shaft gears and bearings. Check that there are no signs of worn, chipped, or broken teeth on idler and center pinion shaft gears.

L) Check door bearings. Visually check excess movement on bearings at door assembly. If excess movement is found, door must be removed making careful note of bearing washer positions for reassembly.

M) Check door switch system. Visually check that door switch valve has sufficient strength to hold door in closed position. If this is not the case, then repairs are required.

N) Check door safety device. Functionally check tong door safety switch. Engage low gear, open tong door and push rotor control lever forward as if to rotate rotor. If safety device is operational then the rotor will not rotate.

O) Check lifting hanger test date. Check lifting hanger for damage. Ensure that a load test and inspection was carried out within the last 9 months.

P) Check condition of all hydraulic hoses and fittings. Visually inspect all hydraulic hoses fitted to the tong for any signs of leaks, cuts, or wear.

Q) Reinstall all parts which were removed for inspection and/or damage. Connect to hydraulic power supply and function test operation of tong in high, low, forward, and reverse. Torque test utilizing appropriate dies and test mandrel. Test operation of lift cylinder.

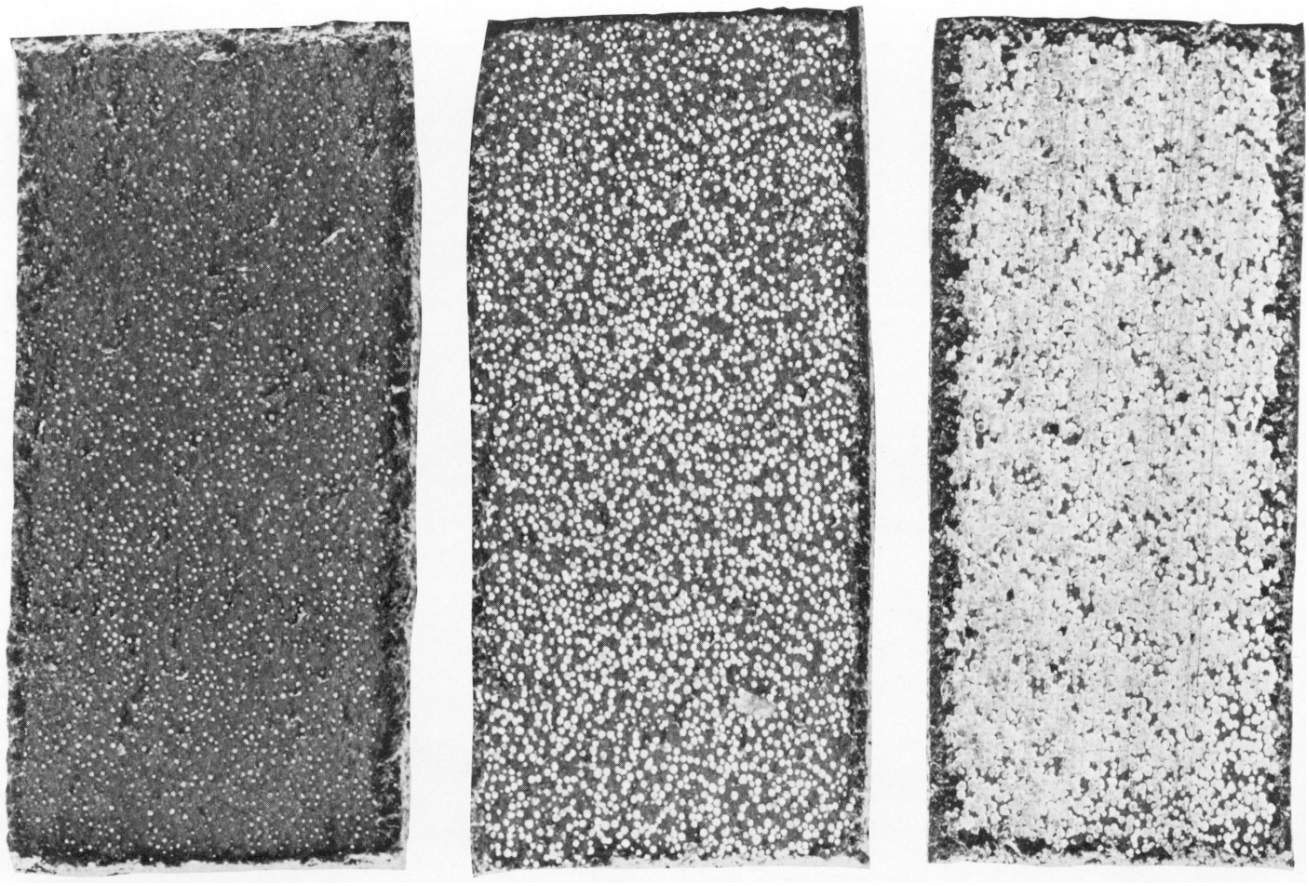
R) Inspect power unit system according to manufactures specifications.

S) Lubricate tong according to maintenance schedule preceding this section.

T) Paint, remembering to mask off surfaces not intending to paint with grease or masking tape.

U) Complete dated inspection report giving details of all duties performed along with complete list of items replaced.

DU® BEARING DRY WEAR PROCESS



1. 2. 3.

1. Running-in completed. Low wear rate starts when up to 10% of the bronze is exposed.

2. Typical surface appearance when DU® bearing approaches its half life with 40% to 50% of the bronze exposed.

3. Bronze is beginning to smear near the end of DU's useful life as a dry bearing. Over 75% of the bronze is visible at the surface.

For additional information about DU bearings, please contact Garlock Bearings Inc,
700 Mid Atlantic Parkway, Thorofare, New Jersey 08086. **(609) 848-3200** FAX: (609) 848-5115

TROUBLE SHOOTING

HYDRAULIC SYSTEM

Hydraulic Pump Making Excessive Noise:

	Problem	Solution
A)	Restricted or clogged intake line	Clean line, check for contamination.
B)	Contaminated fluid	Flush system, change fluid.
C)	Restricted vent	Clean or replace air vent.
D)	Air in fluid	Check for leaks and be certain fluid suction in tank is well below hydraulic fluid in reservoir.
E)	Damaged or worn parts	Repair or replace damaged parts, check fluid for contamination.
F)	Excessive RPM	Check PTO, gears and recommended speed to assure proper pump is installed for operation.
G)	Increased friction	Make sure pump has been assembled using correct torque valves.
H)	Damaged or worn relief valve.	Replace relief valve.
I)	Damaged or worn check valve.	Replace check valve.
J)	Restricted discharge	Check to make sure relief valve is set to proper pressure.
K)	Valve system restricted	Inspect and repair or replace defective parts, check system for contamination.

TROUBLE SHOOTING

Excessive Wear to Hydraulic Components:

	Problem	Solution
A)	Fluid contamination	Flush fluid system, replace with new fluid.
B)	Components misaligned	Inspect and realign.
C)	High operating pressures	Gauge and set to proper pressure.
D)	Exhausted fluid (depletion of additives)	Flush fluid system, replace with new fluid.
E)	Air in fluid	Check for leaks, and be certain fluid suction in tank is well below hydraulic fluid in reservoir.
F)	Shortened bearing life	Check alignment, insure proper lubrication to non-sealed bearings.

HYDRAULIC TONG SECTION

Slow Tong Speed:

	Problem	Solution
A)	Restricted supply line	Clear supply line and check intake on reservoir.
B)	Low fluid level	Add fluid to proper volume.
C)	Air leak	Locate and repair leak.
D)	Pump speed insufficient	Assure proper pump speed for application.
E)	Damaged or worn equipment	Isolate pump and check pressure to determine whether motor or pump is defective. Repair or replace defective part.
F)	Pump not primed	Check fluid viscosity and restrictions of intake line. Replace fluid if inadequate for operating temperature.
G)	Low or no flow from supply line	Check to assure couplings are securely fastened.
H)	Hydraulic bypass valve malfunction	Inspect. Adjust unloading pressure. Replace or repair as necessary.

TROUBLE SHOOTING

Insufficient Torque:

	Problem	Solution
A)	Door switch malfunctioning	Check to make sure door is completely closed. Inspect door switch and dump valve. Replace or repair door switch and/or dump valve.
B)	Relief valve malfunctioning	Relief set too low, broken valve spring, contamination or defective seals.
C)	Damaged or worn pump parts	Inspect, repair or replace.
D)	Slow pump speed	Assure proper pump speed for application.
E)	Improper system fluid	Check fluid viscosity and replace fluid if inadequate for operating temperature.
F)	Directional control valve set improperly	Check relief and directional control valve. Neutral should return slightly to reservoir.

Hydraulic Tongs System:

	Problem	Solution
A)	Damage to motor	Inspect, repair or replace.
B)	Restriction of supply line, excessive back pressure	Check to assure couplings are securely fastened.
C)	Defective gauge or load cell	Inspect, repair or replace. Assure unit has been calibrated to proper arm length. NOTE: When using **CLINCHER®** integral backup system, it is the length of backup arm, NOT the tong arm length.

TROUBLE SHOOTING

Difficulty Shifting Gears:

	Problem	Solution
A)	Broken key in shifting yoke	Inspect and replace key stock in shifting yoke.
B)	Worn or damaged shifting yoke pins	Inspect and replace broken or worn pins.
C)	Insufficient lubrication	Pump grease into both zerts located on shift housing.
D)	Detent ball bearing spring set too tight	Inspect and relieve pressure by adjusting set screw on shifting gear PN 55084.

Failure to Grip Tubulars:

	Problem	Solution
A)	Jaws move out from neutral, but fail to penetrate pipe. Tong not perpendicular.	Inspect die size and replace with correct dies for pipe. Wrong size dies for tubulars. Assure suspension of tong is perpendicular to tubulars. Adjust hanger as necessary.
B)	Jaws fail to move out of neutral. Brake band not tight enough, faulty cam followers, rust debris or damage to jaws.	Inspect for excessive wear on brake band. Inspect and replace defective cam followers. Remove rust and debris from jaws, and jaw pockets. Inspect jaw rollers and pins for wear, flats, and lubrication. Repair, replace, and lubricate as needed.
C)	Tong will not release from tubular. Brake band not tight enough, defective cam followers in cage plate, insufficient lubrication to jaw pin and roller.	Inspect for excessive wear on brake band. Inspect and replace defective cam followers. Remove rust and debris from jaws, and jaw pockets. Inspect jaw rollers and pins for wear, flats, and lubrication. Repair, replace, and lubricate as needed.

TROUBLE SHOOTING

Failure to Grip Tubulars:

	Problem	Solution
D)	Tong motor runs but ring gear does not rotate. Broken gears or defective shift in Hydraulic Tongs System.	Inspect and replace defective gears. Inspect and repair or replace defective shifting parts.
E)	Tong binds under light load. Worn or damaged cam followers, dumbell roller bearing or idler bearing.	Inspect and replace defective parts.
F)	Ring gear rotates while control lever is in neutral	Replace control valve.
G)	Shift will not stay in set position. Lost detent ball or spring.	Replace detent ball and spring.
H)	Hydraulic fluid leaking from motor. Damaged or worn motor shaft seal.	Replace motor shaft seal.

SECTION 7 RECOMMENDED SPARE PARTS LIST FOR REMOTE AREAS

Quantity	Part Number	Description
1	1250 1437	Seal for Rineer Motor
2	76013-01	Dovetail Jaw Pins (5" - 14 3/8")
2	14059-01	DT Jaw Rollers (5" - 14 3/8")
2	14062	LF Jaw Rollers (7 5/8 - 11 3/4)
2	14031-02	LF Jaw Rollers (4 1/2 - 7 5/8)
6	22DU24	Garlock Bushings for LF Jaw Rollers
2	14063	Low Friction Jaw Pins
8	1001	1/8 NPT Zerts
1	SLV1000-01	Door Switch
1	45072	Shifting Yoke
1	14157	Brake Band Weldment
8	BUC4019	Jaw Retract Spring
1	DVG35-HMRV	DVG35 Relief Cartridge

ACCESSORIES AND OPTIONS

Several different accessory items are available for the **CLINCHER®** Tong to allow them to be customized to provide a system most appropriate for the inducer's application.

CLE14000-08 Tong Accessories

Compression Load Cell and Torque Gauge	directly measures applied torque
Tension Load Cell and Torque Gauge	directly measures applied torque
Solenoid Operated Module for Dump Valve	allows computer to limit torque applied
Adapter for Turns Proximity Switch	allows computer to sense rotation
Lift Cylinder with Integral Spring Hanger	controls vertical position
TSP-80 Tong Speed Control	allows slow speed rotation with full torque
2 Speed Motors	
Alternate Motor Displacements	
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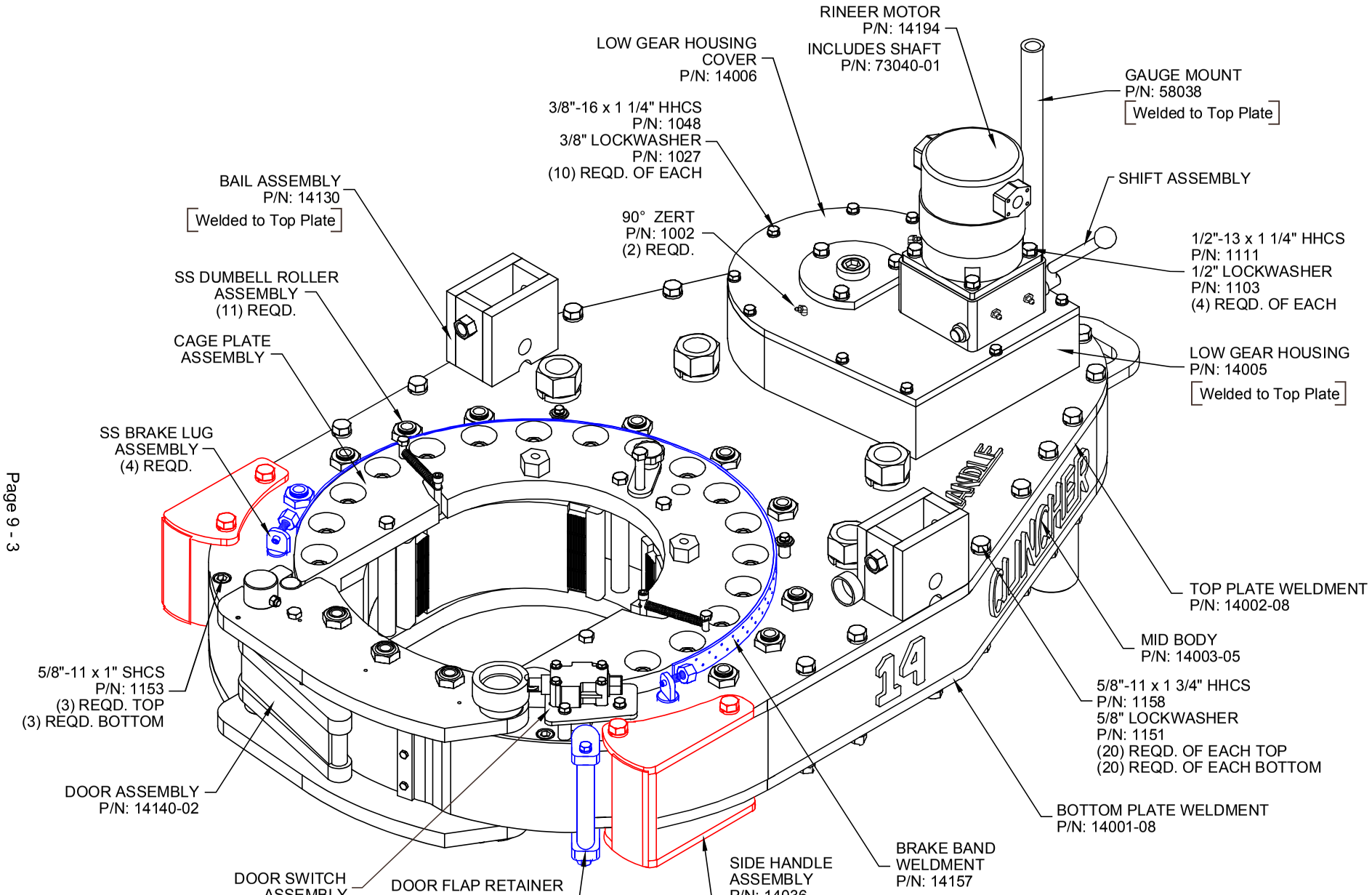

14" CLINCHER® TONG

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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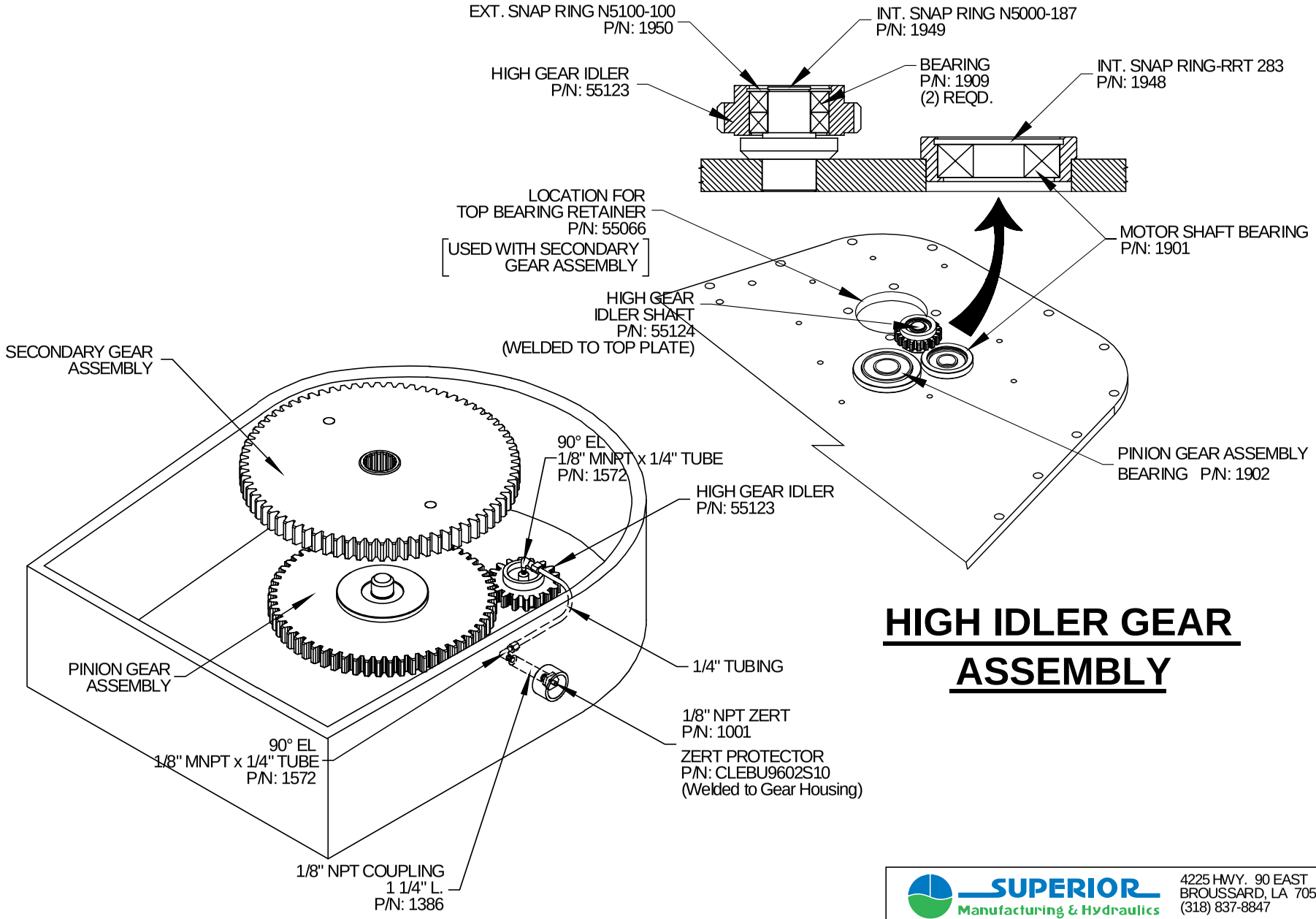

HIGH IDLER GEAR ASSEMBLY

LOW GEAR HOUSING

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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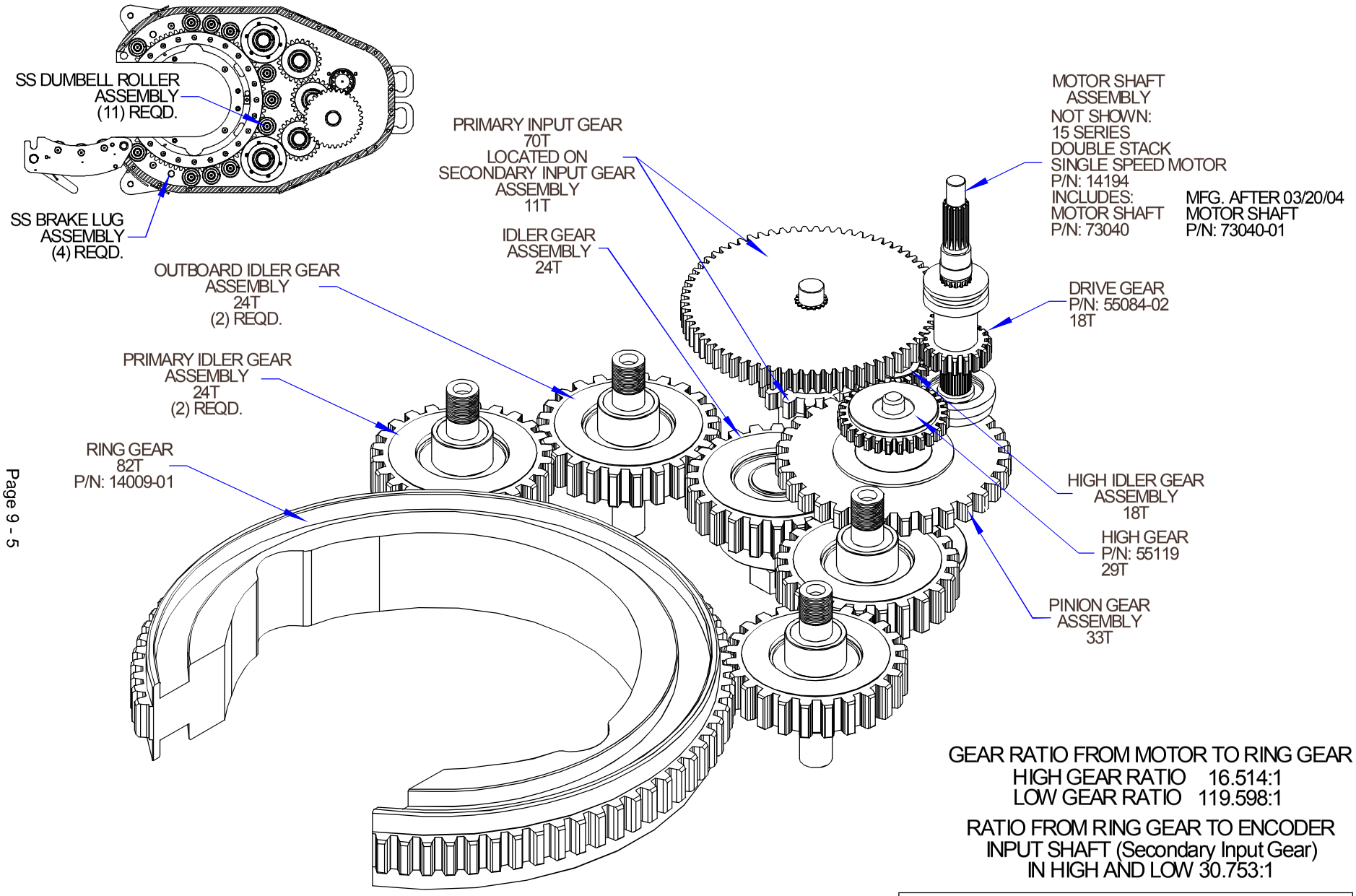
SS DUMBELL ROLLER ASSEMBLY (11) REQD.
SS BRAKE LUG ASSEMBLY (4) REQD.
PRIMARY INPUT GEAR 70T LOCATED ON SECONDARY INPUT GEAR ASSEMBLY 11T
IDLER GEAR ASSEMBLY 24T
OUTBOARD IDLER GEAR ASSEMBLY 24T (2) REQD.
PRIMARY IDLER GEAR ASSEMBLY 24T (2) REQD.
RING GEAR 82T P/N: 14009-01
MOTOR SHAFT ASSEMBLY
NOT SHOWN:
15 SERIES DOUBLE STACK SINGLE SPEED MOTOR
P/N: 14194
INCLUDES:
MOTOR SHAFT P/N: 73040
MFG. AFTER 03/20/04 MOTOR SHAFT P/N: 73040-01
DRIVE GEAR P/N: 55084-02 18T
HIGH IDLER GEAR ASSEMBLY 18T
HIGH GEAR P/N: 55119 29T
PINION GEAR ASSEMBLY 33T

GEAR RATIO FROM MOTOR TO RING GEAR
HIGH GEAR RATIO 16.514:1
LOW GEAR RATIO 119.598:1

RATIO FROM RING GEAR TO ENCODER INPUT SHAFT (Secondary Input Gear) IN HIGH AND LOW 30.753:1

14" TONG GEAR TRAIN

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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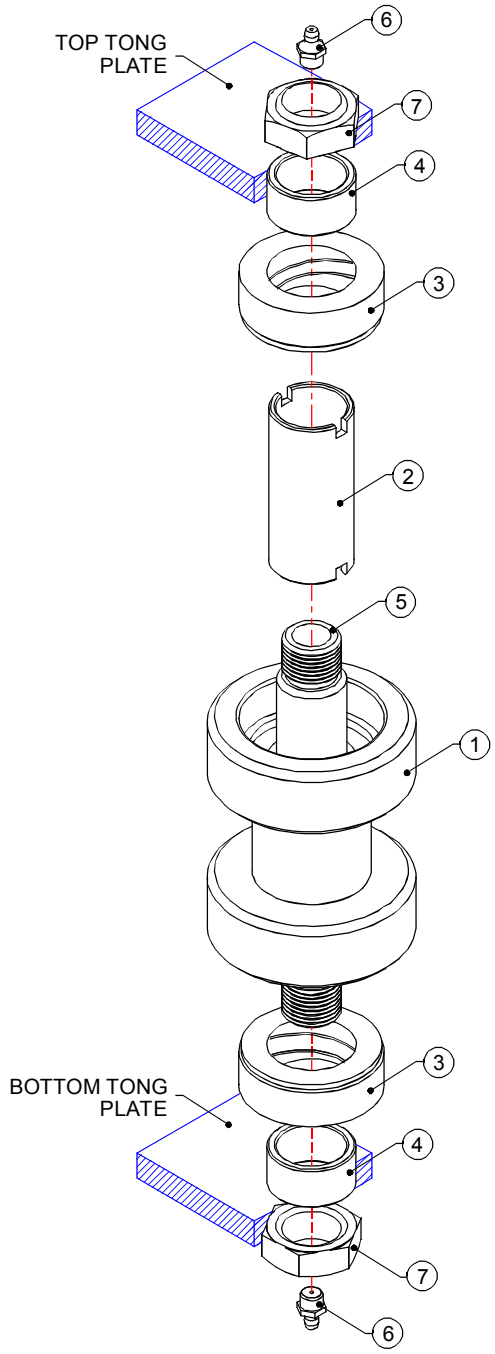
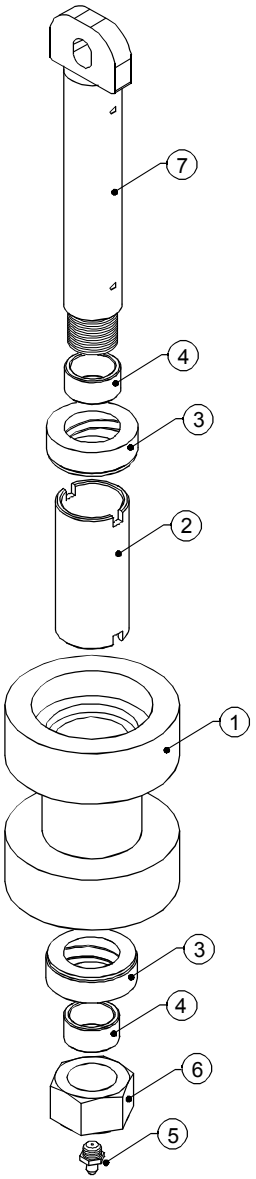
		12/10/04
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\CLE14000-08\Gear Train.wpg

Item #	Qty.	Part Number	Part Name
1	1	55025-B	DUMBELL ROLLER
2	1	55027-D	DUMBELL ROLLER SPACER
3	2	55191	DUMBELL ROLLER BUSHING
4	2	55192	DUMBELL ROLLER SPACER
5	1	76025-A	DUMBELL ROLLER SHAFT
6	2	1001	1/8 NPT ZERT
7	2	1213	1"-12 LOW PROFILE NYLOCK NUT

Item #	Qty.	Part Number	Part Name
1	1	55025-B	DUMBELL ROLLER
2	1	55027-D	DUMBELL ROLLER SPACER
3	2	55191	DUMBELL ROLLER BUSHING
4	2	55192	DUMBELL ROLLER SPACER
5	1	1001	1/8 NPT ZERT
6	1	1213	1"-12 LOW PROFILE NYLOCK NUT
7	1	14156	BRAKE LUG WELDMENT





SEVERE SERVICE DUMBELL ROLLER ASSEMBLY

ASSEMBLY NO. 55158

SEVERE SERVICE BRAKE LUG ASSEMBLY

ASSEMBLY NO. 14187

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		11/03/04
REV. #	LOG #	DATE

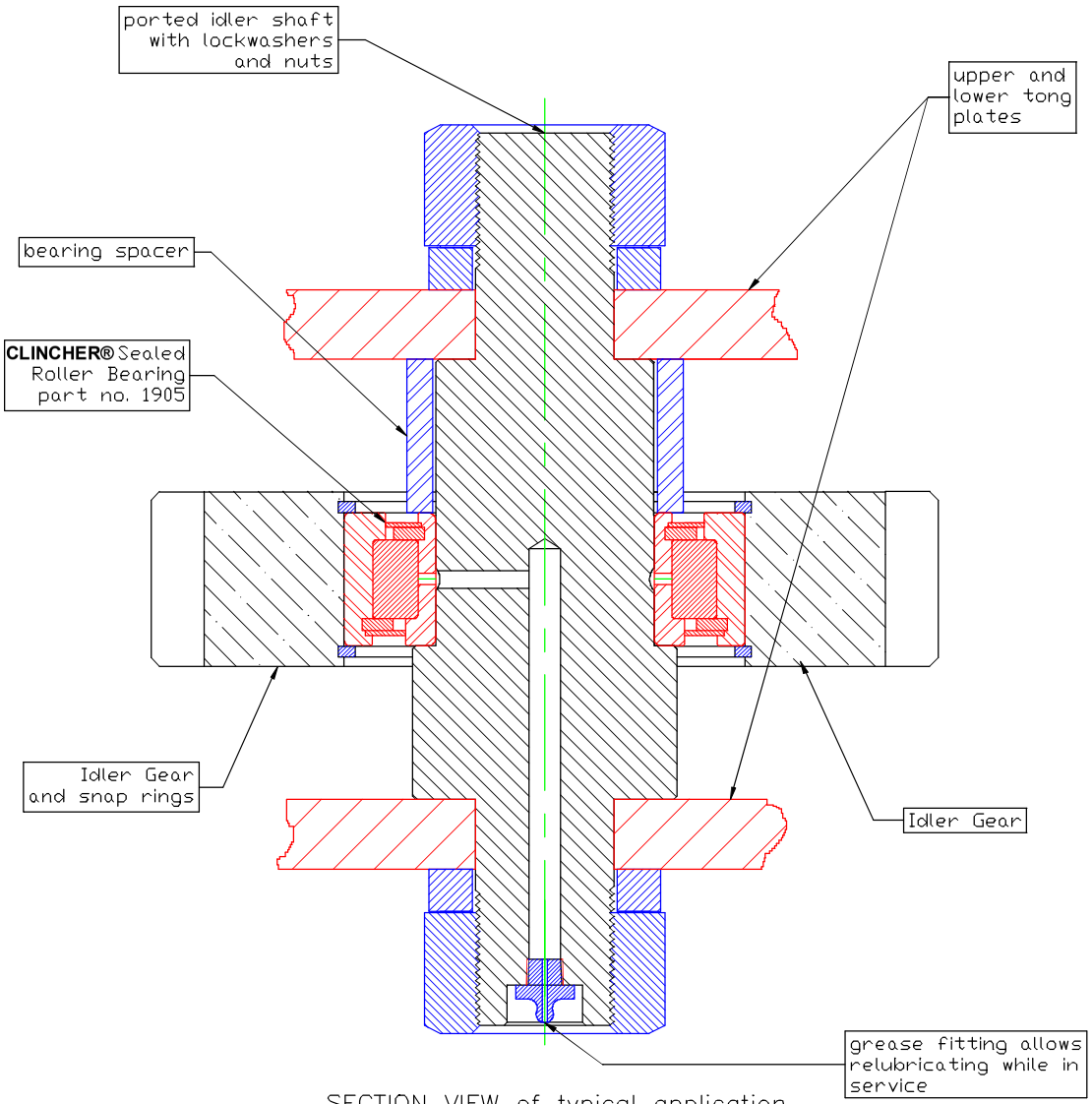
REF: S:\Equip Manuals-Dwgs\CLE14000-10\Dumbell Assy SS.wpg

Features and Benefits:
Proprietary sealed bearing with full compliment roller design offers greater load ratings than commercially available sealed ball bearings. The ported inner race allows the bearing to be relubricated without disassembly. Integral elastomeric seals allow grease to be displaced but prevent migration of contaiminants into bearing.

Elastomeric seals are corrosion resistant and suitable for use in environments which are incompatible with traditional aluminum bearing shrouds.

Unique geometric design allows rollers to absorb thrust loads to maximize component life.

Nominal OD: 4.3307 inches
Nominal ID: 2.3622 inches
Nominal Ht: 1.4375 inches
static rating: 37540 lbs
dynaminc rating: 29230 lbs
(1mm cycles, 33 1/3 RPM f/ 500 hrs.)


ported idler shaft with lockwashers and nuts
upper and lower tong plates
bearing spacer
CLINCHER® Sealed Roller Bearing part no. 1905
Idler Gear and snap rings
Idler Gear
grease fitting allows relubricating while in service

SECTION VIEW of typical application

Rev.#	By	Log#	Description of Revision
3			
2			
1	DB	12/07/02	added desc of thrust load capability

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE — R3

2 PLACE DEC. ±.020	3 PLACE DEC. ±.005	FRACTIONS ± 1/16	ANGLES ± .5°	SURFACE 250	FLATNESS AR PL. ± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

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△1 or ⟨1⟩ = Revision Number

1.000 = Critical Dimension 100% Inspection Required

SHEET 1 of 2

SUPERIOR Manufacturing & Hydraulics
4225 HWY.90 E
BROUSSARD,LA 70518
(318)837-8847

PART NAME: SEALED IDLER BEARING

PART #: 1905

DRAWN BY:

APPROVED BY:

CHK BY: DATE:

REF: REF ILL1000/ILL1142.DWG

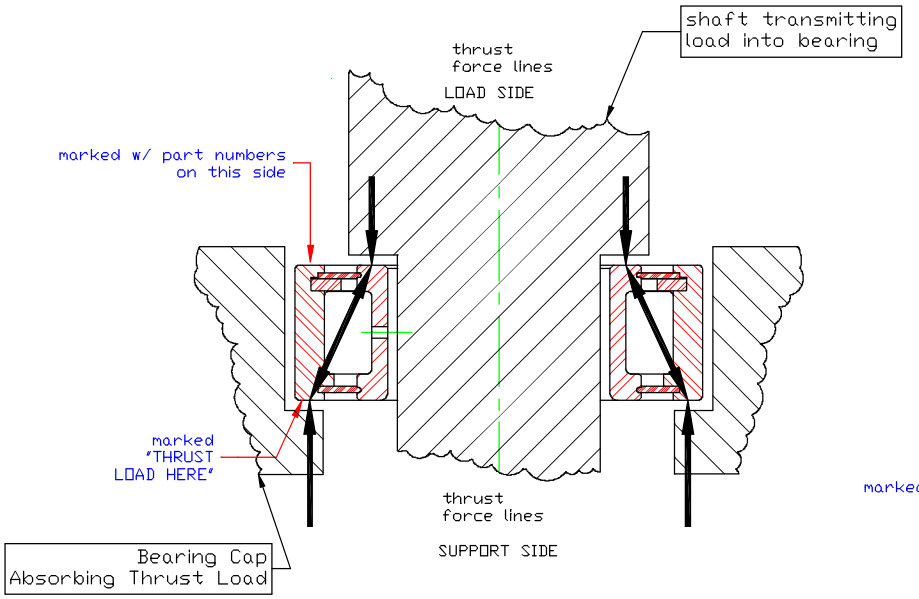
MATERIAL SPECIFICATION

Matl.Req:

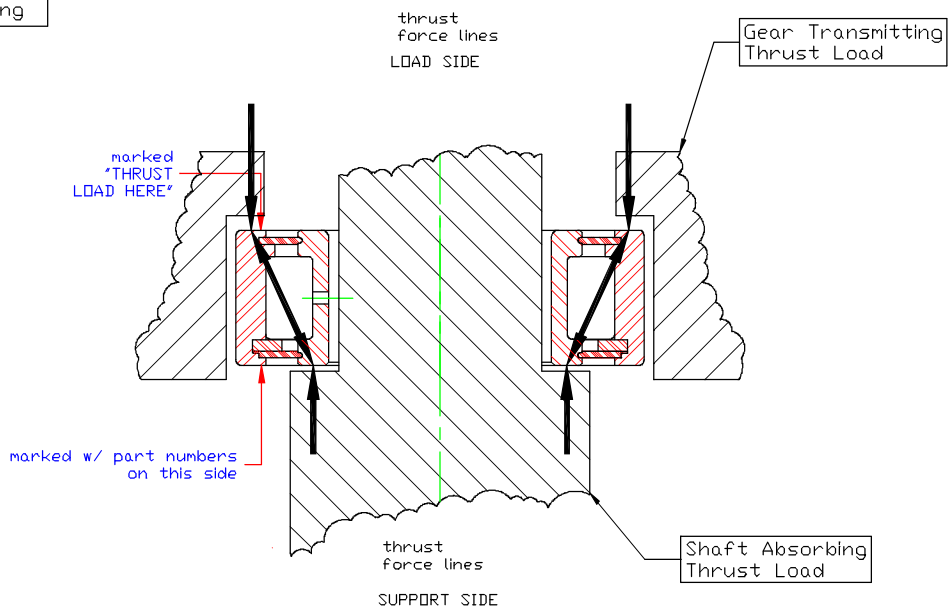
Initial Condition:

Alternative Matl:

H.T Instructions: Case Depth: C.D



Bottom Bearing Cap Application



Gear Support Application

Installation instructions for **CLINCHER®** BEARING Part Number 1905

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE					R3
2 PLACE DEC. ±.020	3 PLACE DEC. ±.005	FRACTIONS ± 1/16	ANGLES ± .5°	SURFACE 250	FLATNESS AR PL. ± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

Rev.#	By	Log#	Description of Revision
3			
2			
1	DB	12/07/02	added desc of thrust load capability

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△1 or ⟨1⟩ = Revision Number

1.000 = Critical Dimension 100% Inspection Required

SHEET 2 of 2

SUPERIOR Manufacturing & Hydraulics
4225 HWY.90 E
BROUSSARD,LA 70518
(318)837-8847

PART NAME: Installation instructions for P/N 1905 SEALED IDLER BEARING

PART #: 1905

DRAWN BY:

APPROVED BY:

CHK BY: DATE:

REF: REF ILL1000/ILL1142.DWG

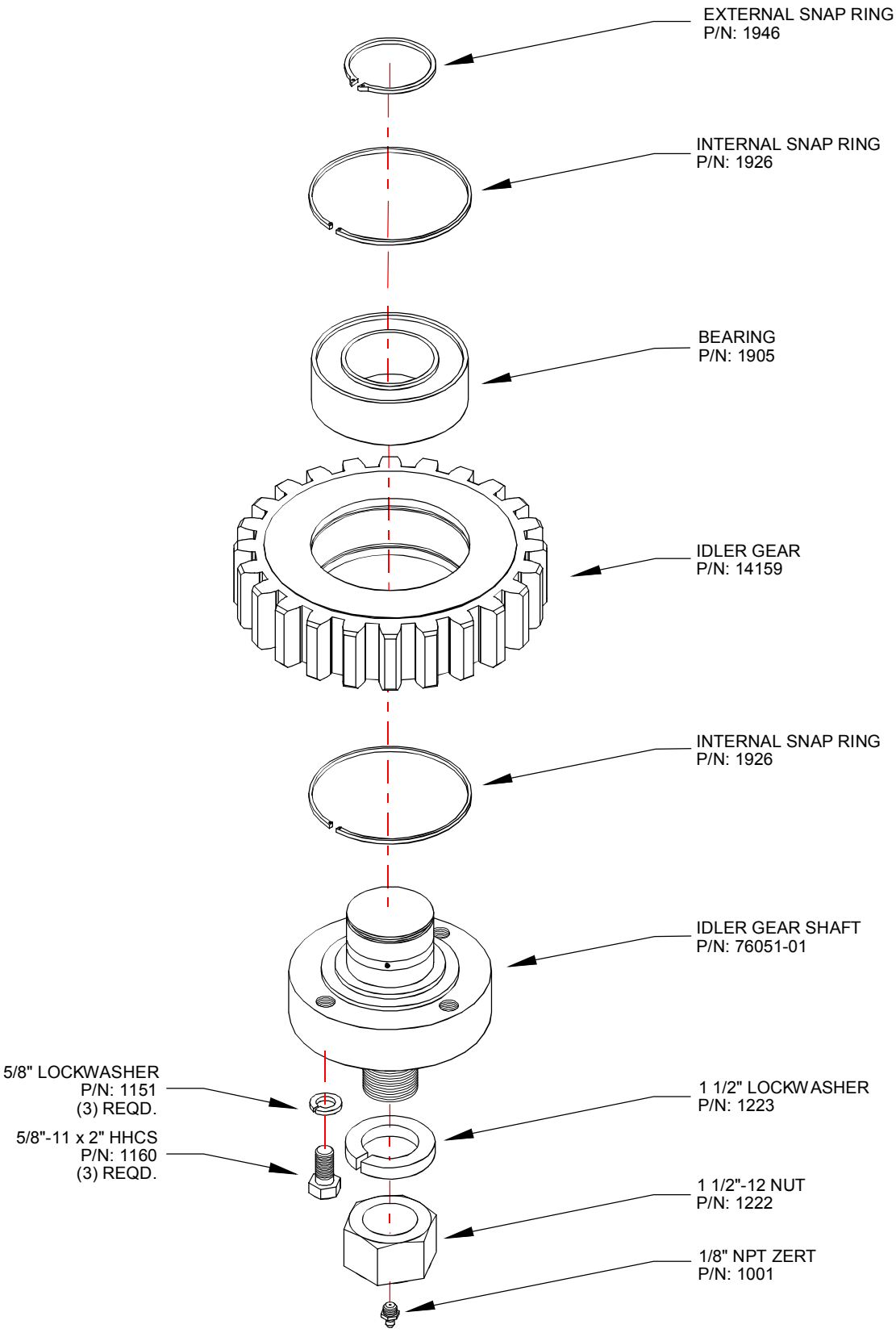
MATERIAL SPECIFICATION

Matl.Req:

Initial Condition:

Alternative Matl:

H.T Instructions: Case Depth: C.D



IDLER GEAR ASSEMBLY

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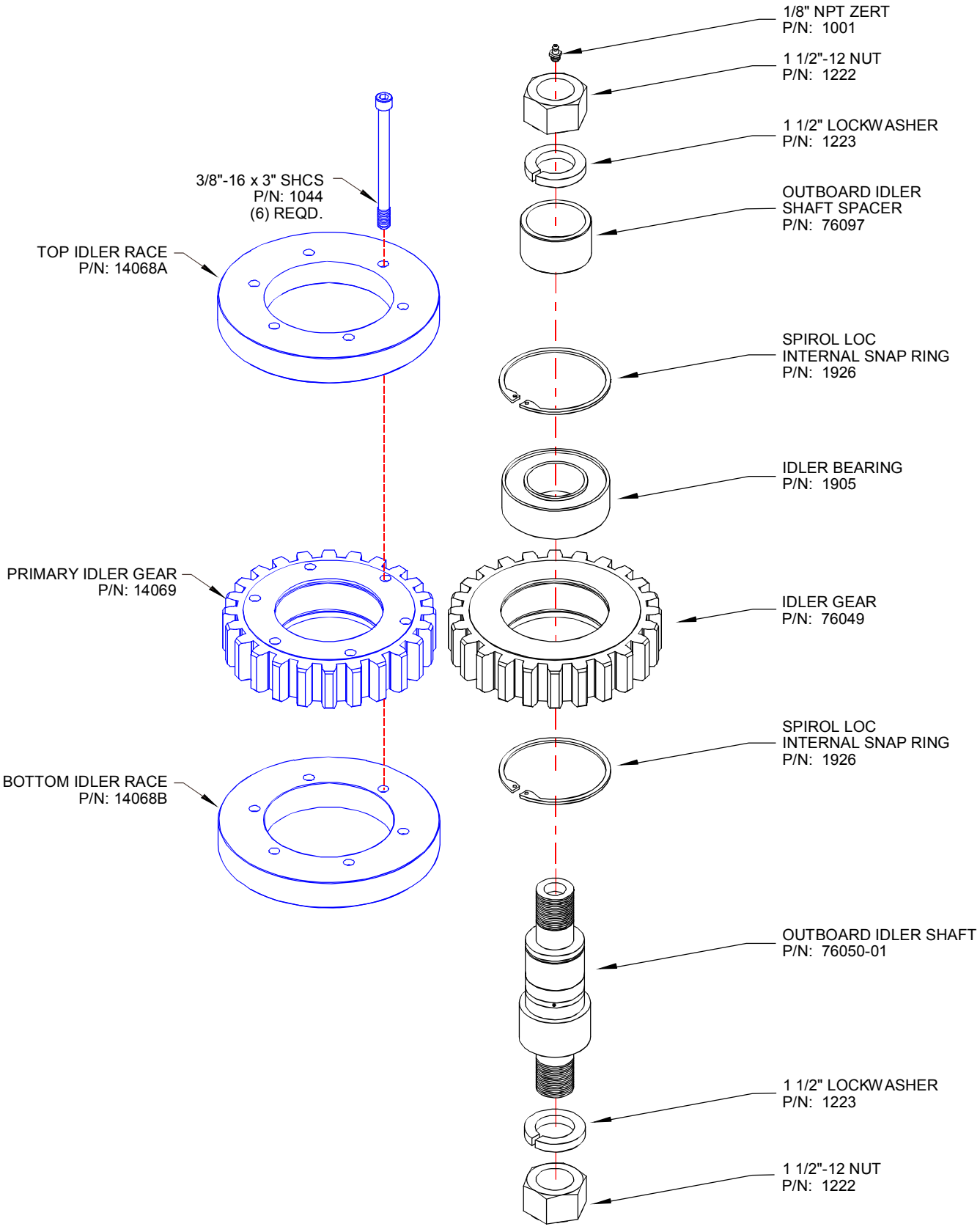
REV. #	LOG #	DATE
		12/08/04

REF: S:\Equip Manuals-Dwgs\CLE14000-08\Idler Gear.wpg



OUTBOARD IDLER GEAR ASSEMBLY

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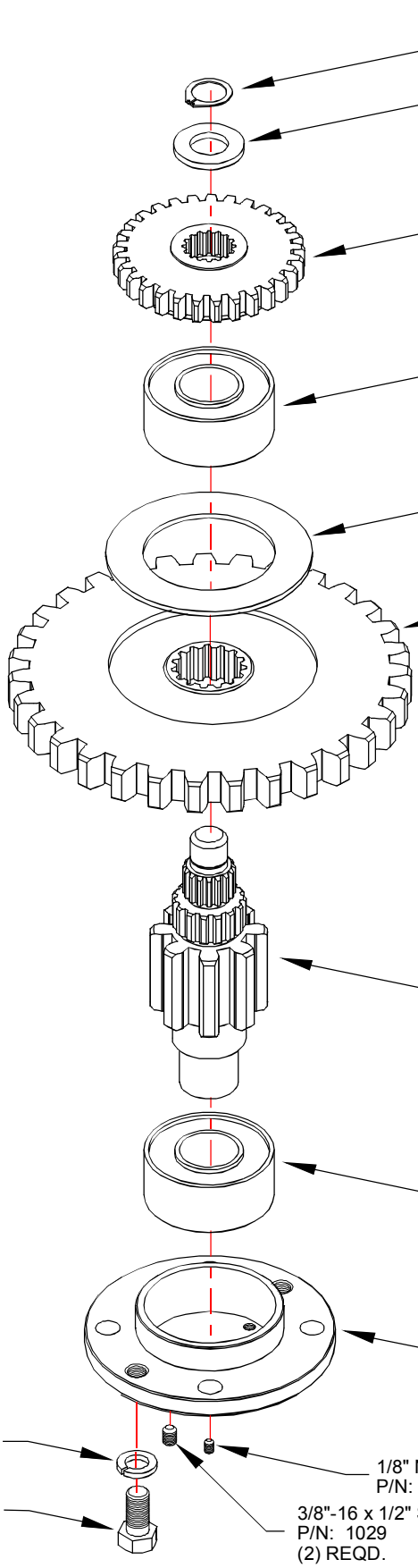
		07/01/03
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\CLE14000-05\Outboard Idler.wpg



Note: Newer tongs utilize different pinion and low pinion gears. These gears are *NOT* interchangeable and must be used in sets.

	STANDARD OLD P/N	***ALTERNATE OLD P/N***	***NEW P/N***
Pinion Gear	55038-01	55038-01	73038
Low Pinion Gear	55047	55047BJ	55161BJ
Pinion Bearing Bushing	55047-1	55047-1	14049
Secondary Input Gear	55048	55048BJ	55048BJ

WARNING: DO NOT REPLACE FLUSH PLUG WITH GREASE ZERT.
BEARING IS A SEALED BEARING.

PINION GEAR ASSEMBLY

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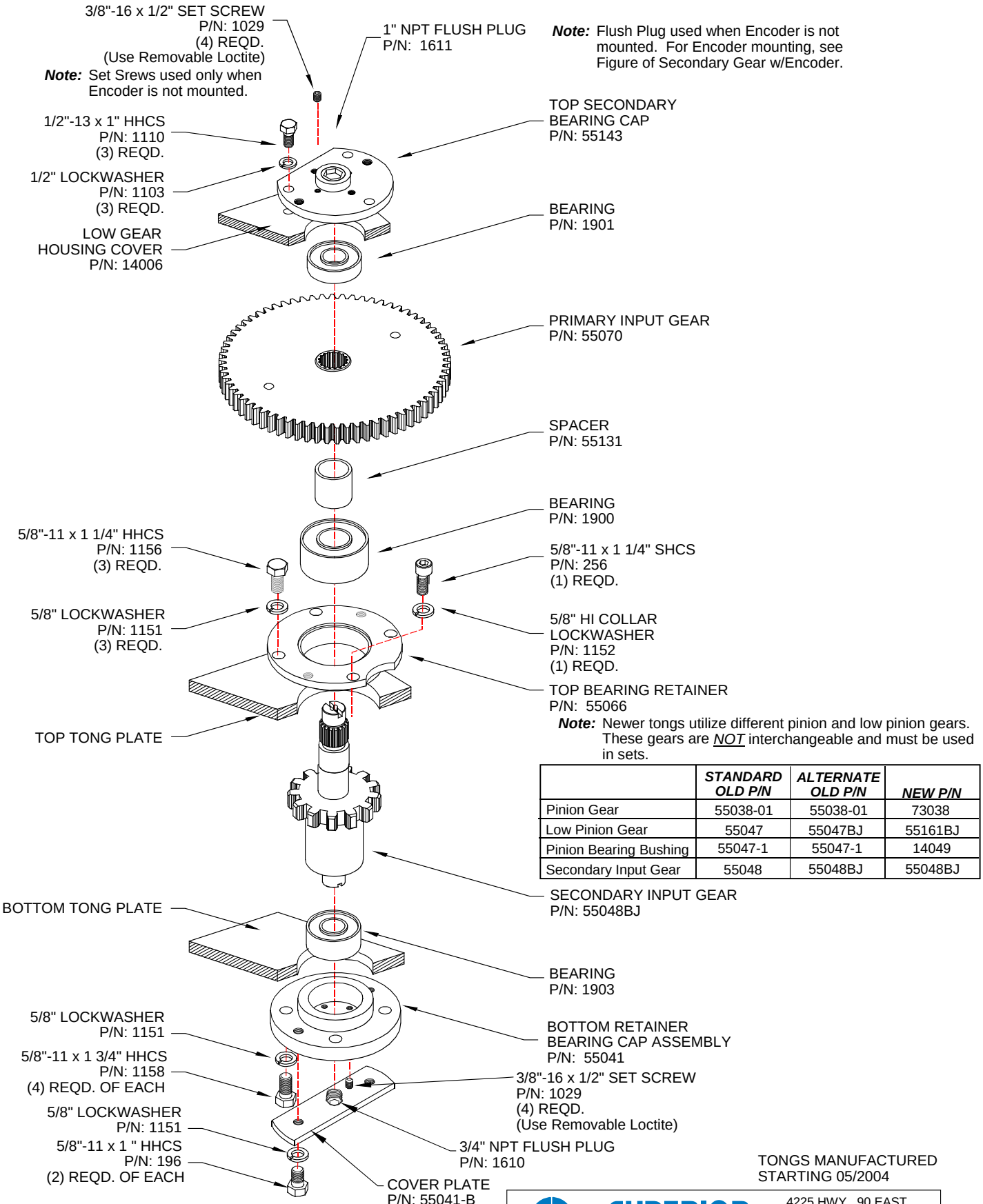
REV. #	LOG #	DATE
1		05/03/04

REF: S:\Equip Manuals-Dwgs\CLE14000-05\Pinion Gear rev1.wpg



	STANDARD OLD P/N	ALTERNATE OLD P/N	NEW P/N
Pinion Gear	55038-01	55038-01	73038
Low Pinion Gear	55047	55047BJ	55161BJ
Pinion Bearing Bushing	55047-1	55047-1	14049
Secondary Input Gear	55048	55048BJ	55048BJ

TONGS MANUFACTURED STARTING 05/2004

SECONDARY GEAR ASSEMBLY

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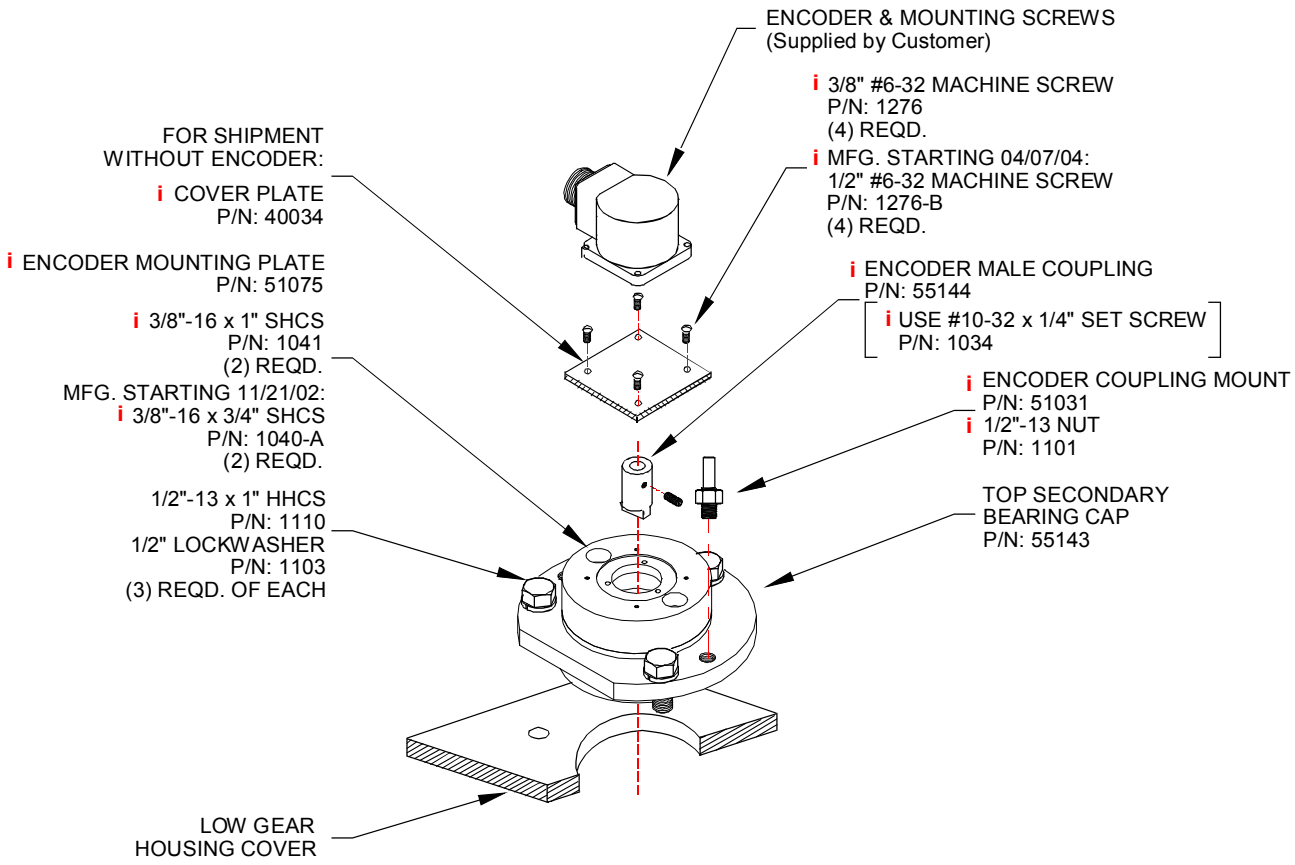
REV. #	LOG #	DATE
2		06/17/05

REF: S:\Equip Manuals-Dwgs\CLE14000-05\Secondary Gear rev2.wpg



ENCODER ASSEMBLY

ENCODER ASSEMBLY NO. 55142 i

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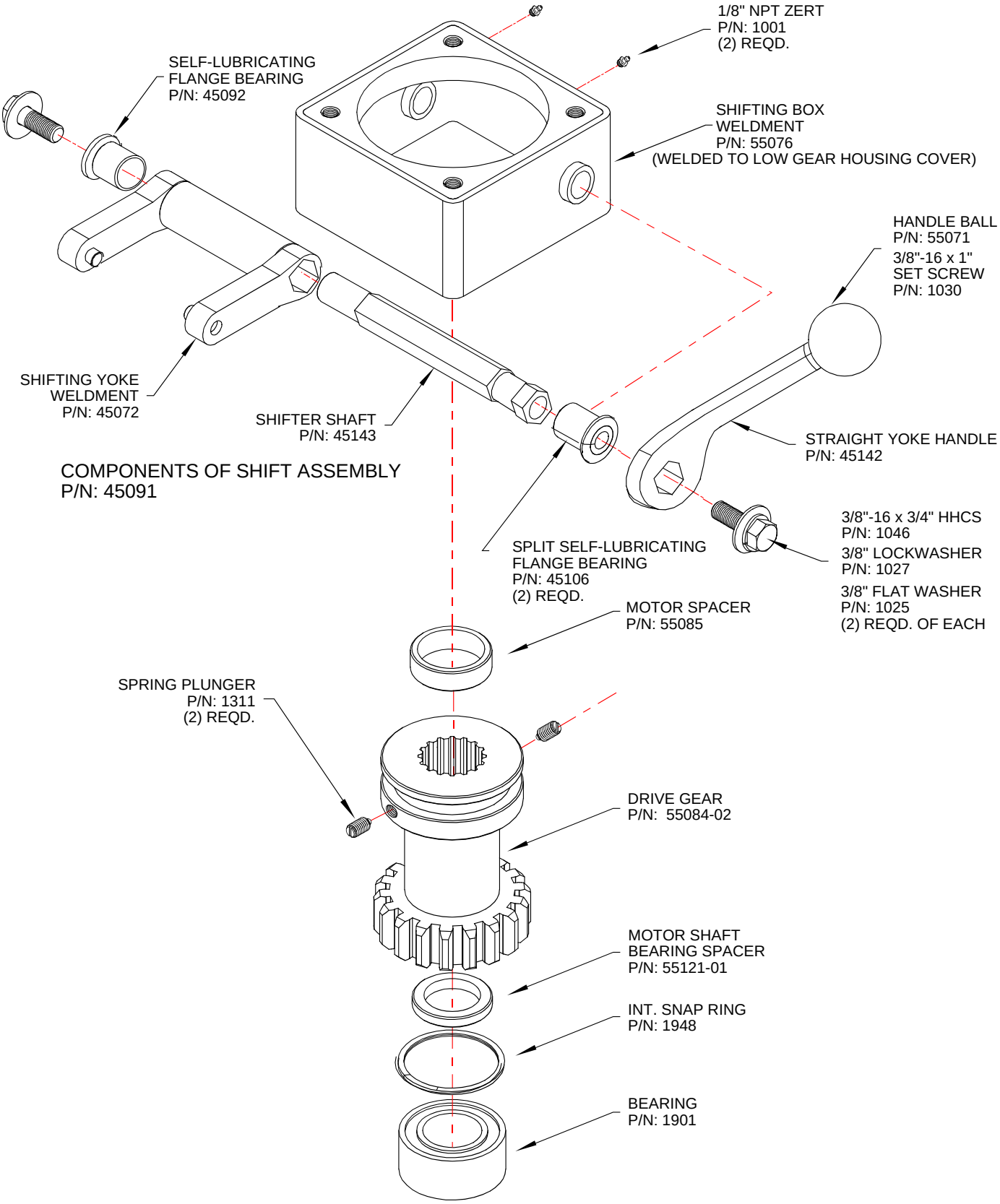
REV. #	LOG #	DATE
2		12/09/04

REF: S:\Equip Manuals-Dwgs\CLE5500\Encoder rev2.wpg



SHIFT GEAR ASSEMBLY

2nd GENERATION

ASSEMBLY NO. 26078

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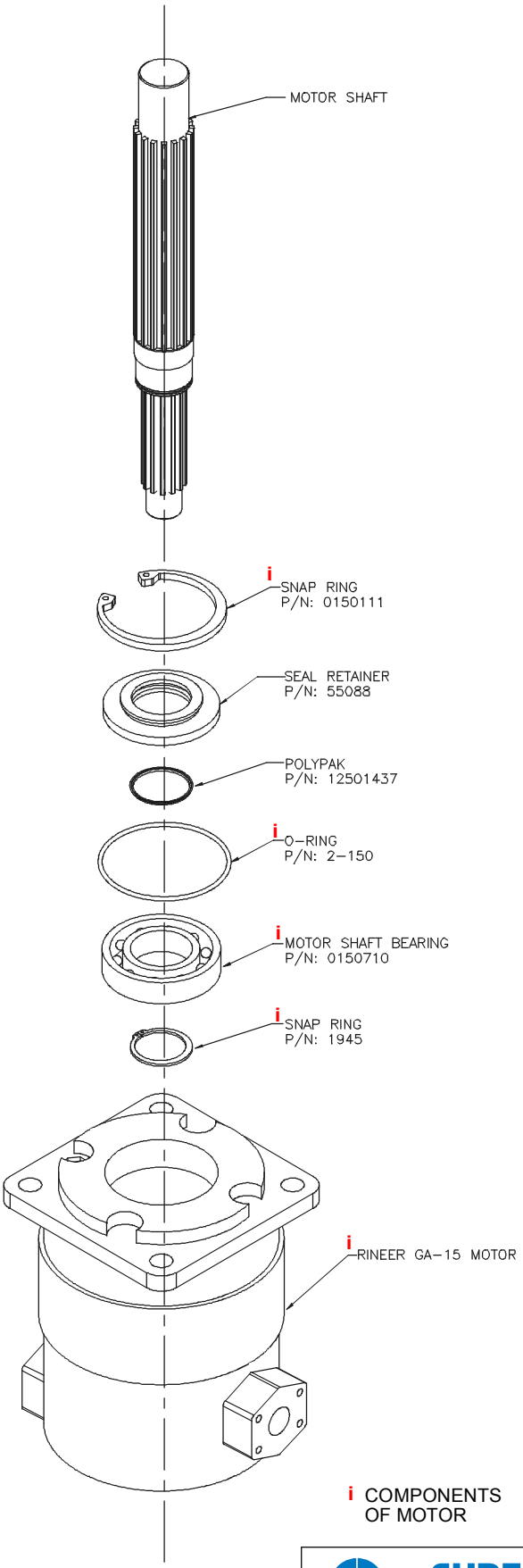
REV. #	LOG #	DATE
3		05/10/05

REF: S:\Equip Manuals\Dwgs\CLE14000DP\Shift Assy 2nd rev3.wpg



i COMPONENTS OF MOTOR

MOTOR ASSEMBLY

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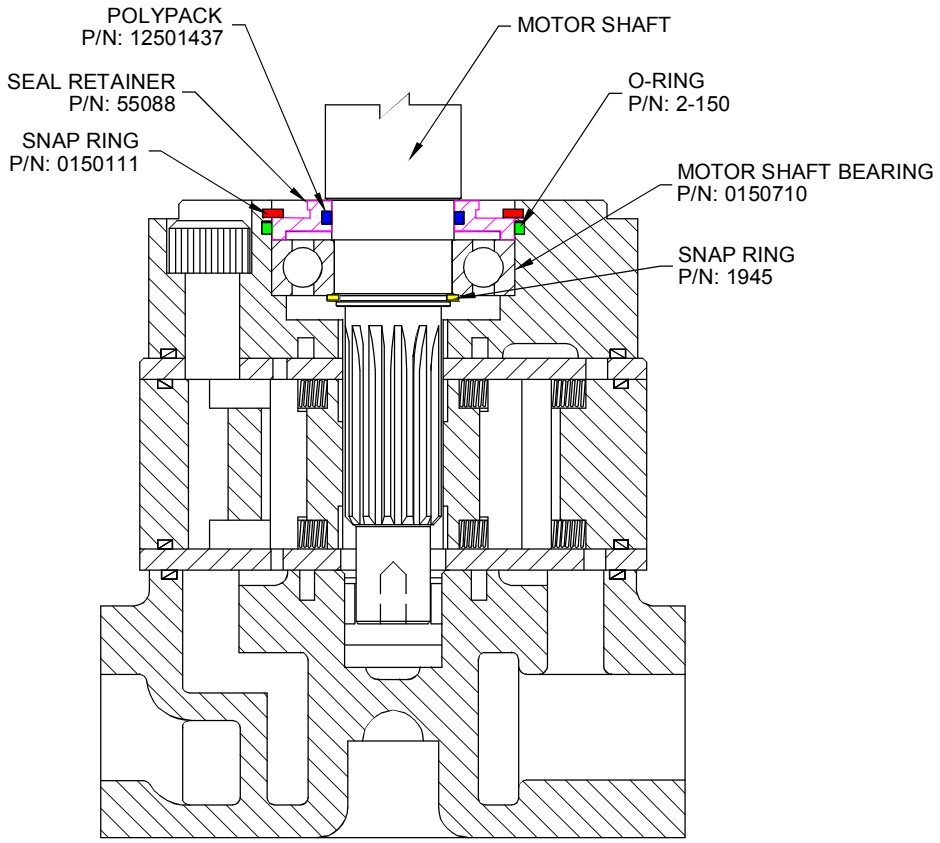
		06/07/02
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\Motor\Motor CLE5500+ sht1.wpg



W/ OUT WIPER RING

MOTOR ASSEMBLY

FOR CLARITY PURPOSE ONLY
NOT TO SCALE

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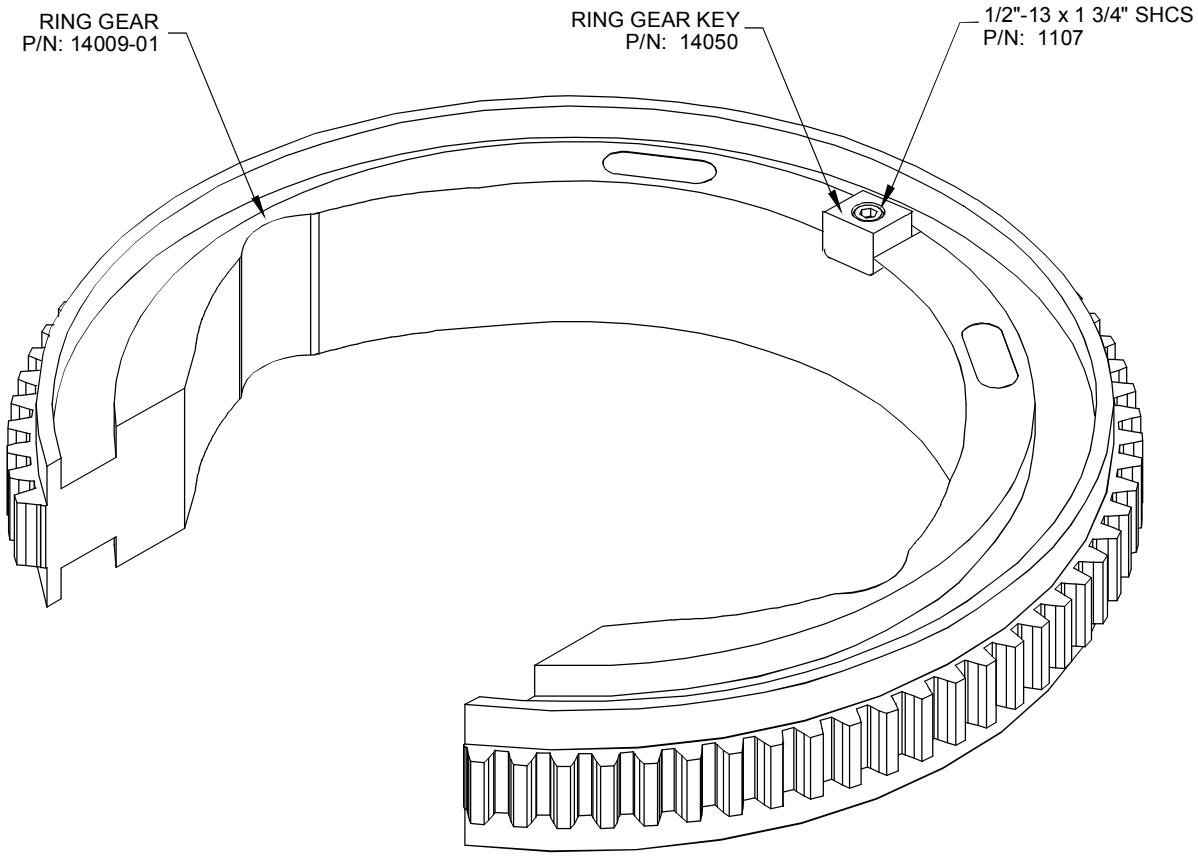
REV. #	LOG #	DATE
2		04/29/03

REF: S:\Equip Manuals-Dwgs\Motor\Motor CLE5500+ sht2 rev2.wpg



RING GEAR ASSEMBLY

ASSEMBLY NO. 14154

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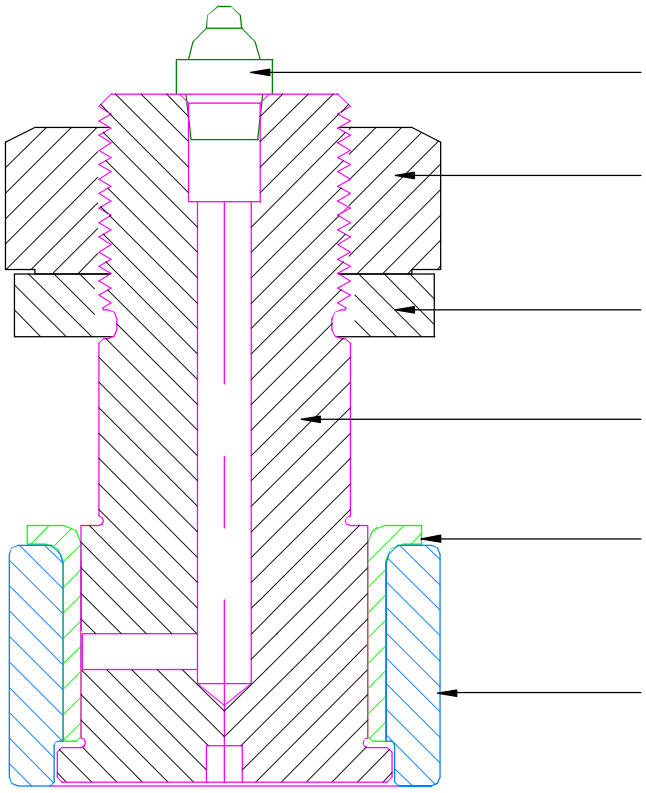
REV. #	LOG #	DATE
1		11/02/04

REF: S:\Equip Manuals-Dwgs\CLE14000-05\Ring Gear rev1.wpg



1/4" DRIVE ZERT
P/N: 1257

7/8"-14 JAM NUT
P/N: 1178
[NOT PART OF ASSEMBLY
FOR REFERENCE ONLY]

7/8" LOCKWASHER
P/N: 1224
[NOT PART OF ASSEMBLY
FOR REFERENCE ONLY]

CAM FOLLOWER STUD
P/N: SSCF1501

FLANGE BUSHING
P/N: SSCF1503
(NOTE 2)

CAM FOLLOWER RACE
P/N: SSCF1502

NOTES:

1. LUBRICATE THREADS WITH NEVER-SEEZ. TORQUE TO 62 1/2 FT/LBS.
2. PRESS INTO RACE USING FX-16DU12.

SECTION VIEW

1 1/2" SEVERE SERVICE CAM FOLLOWER ASSEMBLY

ASSEMBLY NO. SSCF1500

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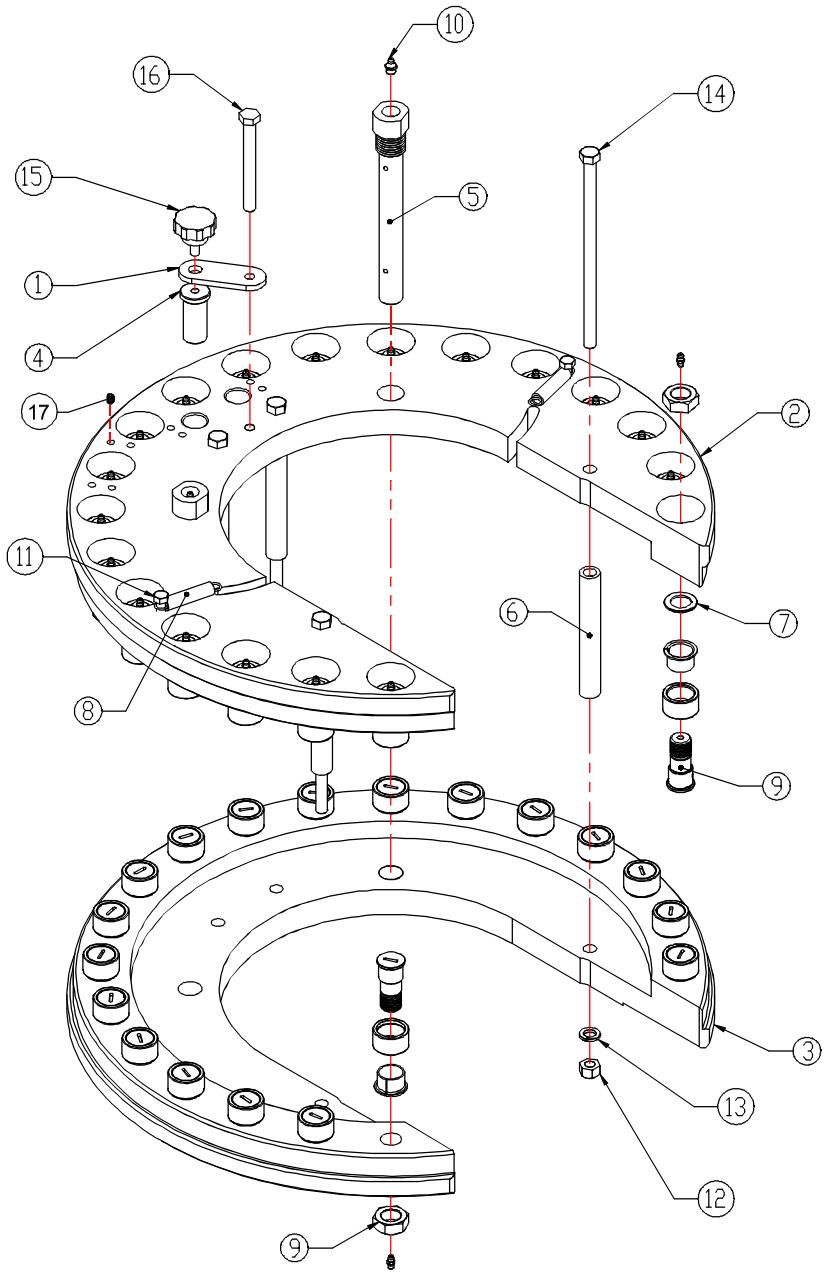
REV. #	LOG #	DATE
1		11/03/04

REF: S:\Equip Manuals\Dwgs\CLE14000\SSCF1500 rev1.wpg



Item #	Qty.	Part Number	Part Name
1	1	76127	LOCKING PIN KEY
2	1	14007-01	TOP CAGE PLATE
3	1	14008	BOTTOM CAGE PLATE
4	1	14044	LOCKING PIN
5	2	14045	PIVOT PIN
6	4	14047	CAGE PLATE SPACER
7	19	14101	CAM FOLLOWER SPACER
8	2	BUC4019	DOOR SPRING #733 -- EXT
9	38	SSCF1500	SEVERE SERVICE CAM FOLLWER ASSEMBLY
10	2	1001	1/8 NPT ZERT
11	2	1060	3/8-16 x 2 1/2 HHCS
12	4	1101	NUT, HEX, 1/2-13
13	4	1103	1/2" LOCKWASHER
14	4	1117-A	1/2"-13 x 9 1/2" HHCS
15	1	DK-28	FLUTED KNOB
16	1	X2-45	1/2-13 x 4 1/2 HHCS
17	8	1029	3/8"-16 x 1/2" SET SCREW

CAGE PLATE ASSEMBLY

ASSEMBLY NO. 14153

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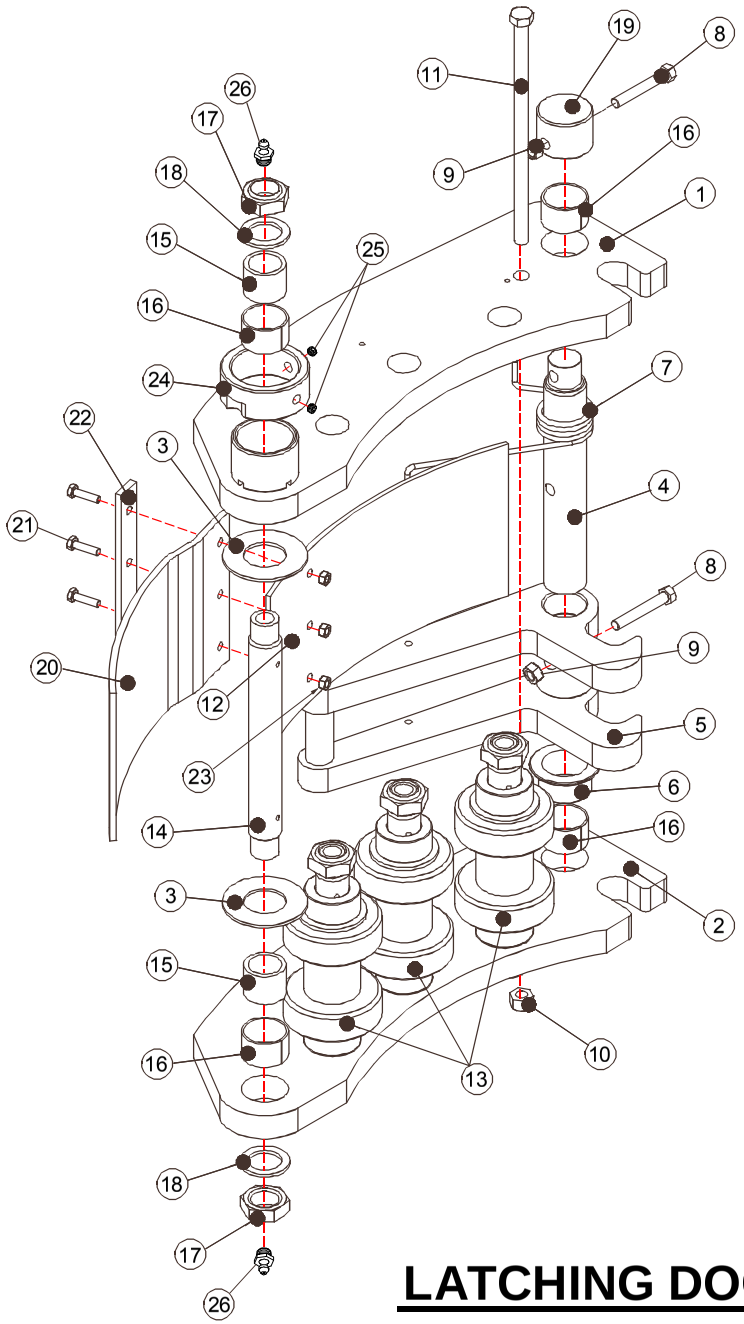
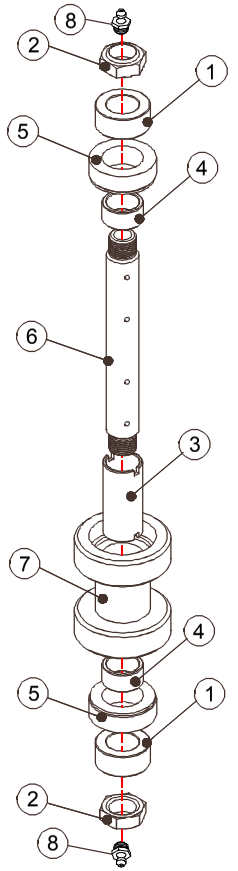
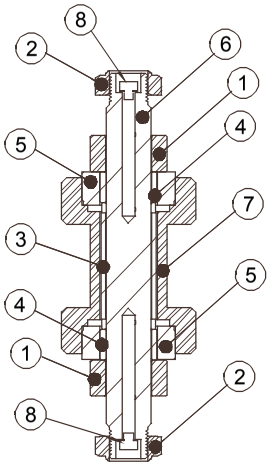
REV. #	LOG #	DATE
1		12/10/04

REF: S:\Equip Manuals-Dwgs\CLE14000-10\14153 rev1.wpg



Item	Qty.	Part Number	Description
1	1	14114-01	TOP DOOR PLATE WELDMENT
2	1	14113-01-S1	BOTTOM DOOR PLATE
3	2	14116	DOOR THRUST BUSHING
4	1	14682-01	DOOR LATCH PIVOT PIN
5	1	14681-01	DOOR LATCH WELDMENT
6	1	55027	DOOR BUSHING
7	1	SMH1501-N	TORSION SPRING
8	2	1060	3/8"-16 x 2 1/2" HHCS
9	2	213	3/8"-16 NYLOCK NUT
10	1	1101	1/2"-13 HEX NUT
11	1	1117-A	1/2"-13 x 9 1/2" HHCS
12	1	14118-01	DUMBELL ROLLER GUARD
13	3	14148 i	DUMBELL ROLLER ASSEMBLY
14	1	14120-01	DOOR SHAFT
15	2	14121	SPACER
16	4	2021	GARLOCK BUSHING 1 1/2" x 1"
17	2	1213	1"-12 LOW PROFILE NYLOCK NUT
18	2	2040	DOOR BUSHING
19	1	73177	DOOR PIVOT PIN PROTECTOR
20	1	14150	RUBBER GUARD
21	3	105	1/4"-20 x 1" HHCS
22	1	14151	SUPPORT STRIP
23	3	100	1/4"-20 HEX NUT
24	1	76131	DOOR SWITCH ADJ. SLEEVE
25	2	1029	3/8"-16 x 1/2" SET SCREW
26	2	1001	1/8" NPT ZERT

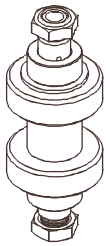




SECTION

DUMBELL ROLLER ASSEMBLY

ASSEMBLY NO. 14148 i



Item	Qty.	Part Number	Description
1	2	14113-S2	DOOR DOUBLER
2	2	1213	1"-12 LP NYLOCK NUT
3	1	55027-D	DUMBELL ROLLER SPACER
4	2	55192	DUMBELL ROLLER SPACER
5	2	55191	DUMBELL ROLLER BUSHING
6	1	55022-A	SHAFT
7	1	14123	DOOR ROLLER
8	2	1001	1/8" NPT ZERT

LATCHING DOOR ASSEMBLY

ASSEMBLY NO. 14140-02

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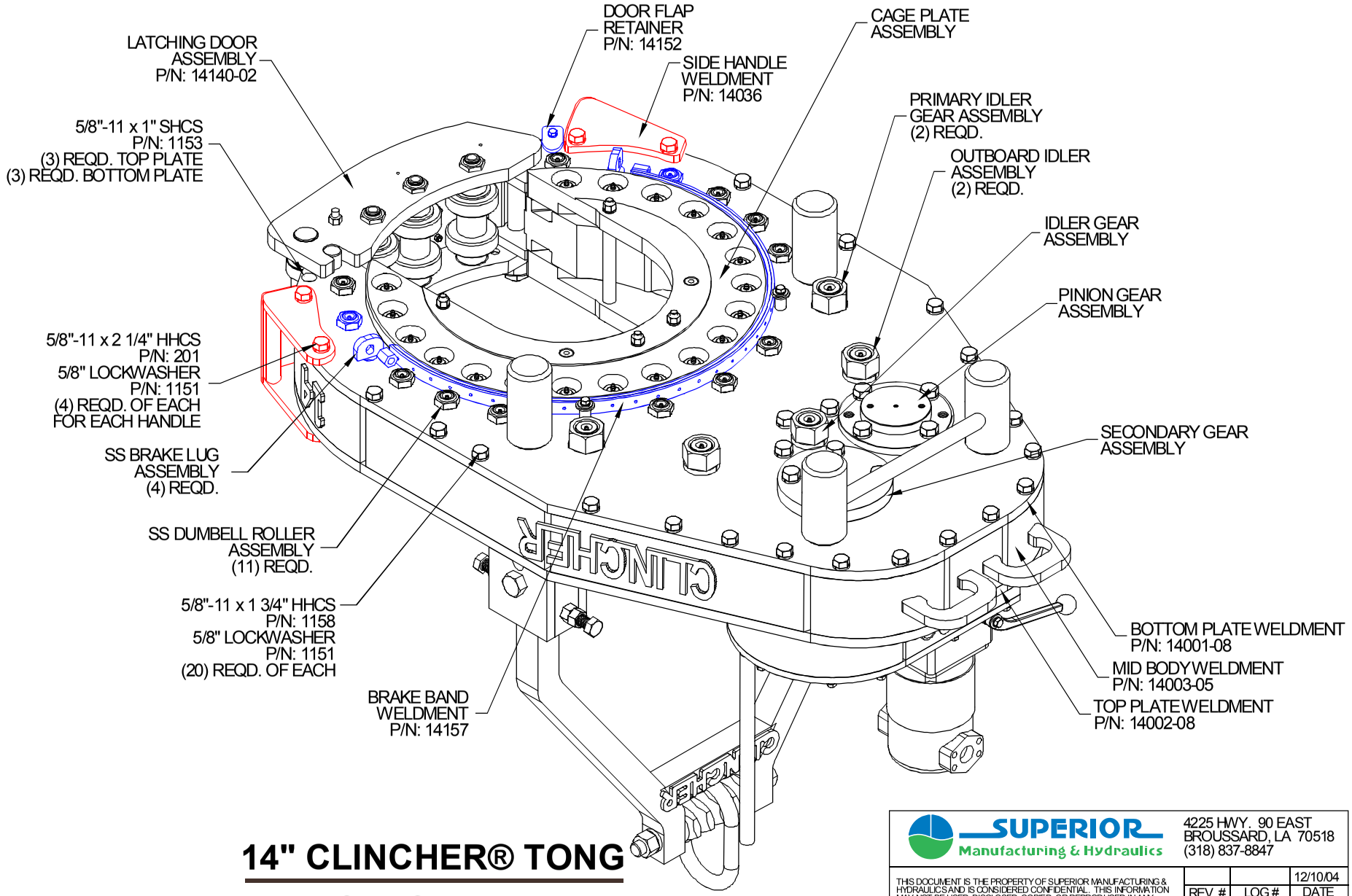
REV. #	LOG #	DATE
		06/18/03

REF: S:\Equip Manuals-Dwgs\CLE14000-04\Door Assy.wpg


LATCHING DOOR ASSEMBLY P/N: 14140-02
5/8"-11 x 1" SHCS P/N: 1153 (3) REQD. TOP PLATE (3) REQD. BOTTOM PLATE
5/8"-11 x 2 1/4" HHCS P/N: 201 5/8" LOCKWASHER P/N: 1151 (4) REQD. OF EACH FOR EACH HANDLE
SS BRAKE LUG ASSEMBLY (4) REQD.
SS DUMBELL ROLLER ASSEMBLY (11) REQD.
5/8"-11 x 1 3/4" HHCS P/N: 1158 5/8" LOCKWASHER P/N: 1151 (20) REQD. OF EACH
BRAKE BAND WELDMENT P/N: 14157
DOOR FLAP RETAINER P/N: 14152
SIDE HANDLE WELDMENT P/N: 14036
CAGE PLATE ASSEMBLY
PRIMARY IDLER GEAR ASSEMBLY (2) REQD.
OUTBOARD IDLER ASSEMBLY (2) REQD.
IDLER GEAR ASSEMBLY
PINION GEAR ASSEMBLY
SECONDARY GEAR ASSEMBLY
BOTTOM PLATE WELDMENT P/N: 14001-08
MID BODY WELDMENT P/N: 14003-05
TOP PLATE WELDMENT P/N: 14002-08
CLINCHER

14" CLINCHER® TONG

BOTTOM VIEW

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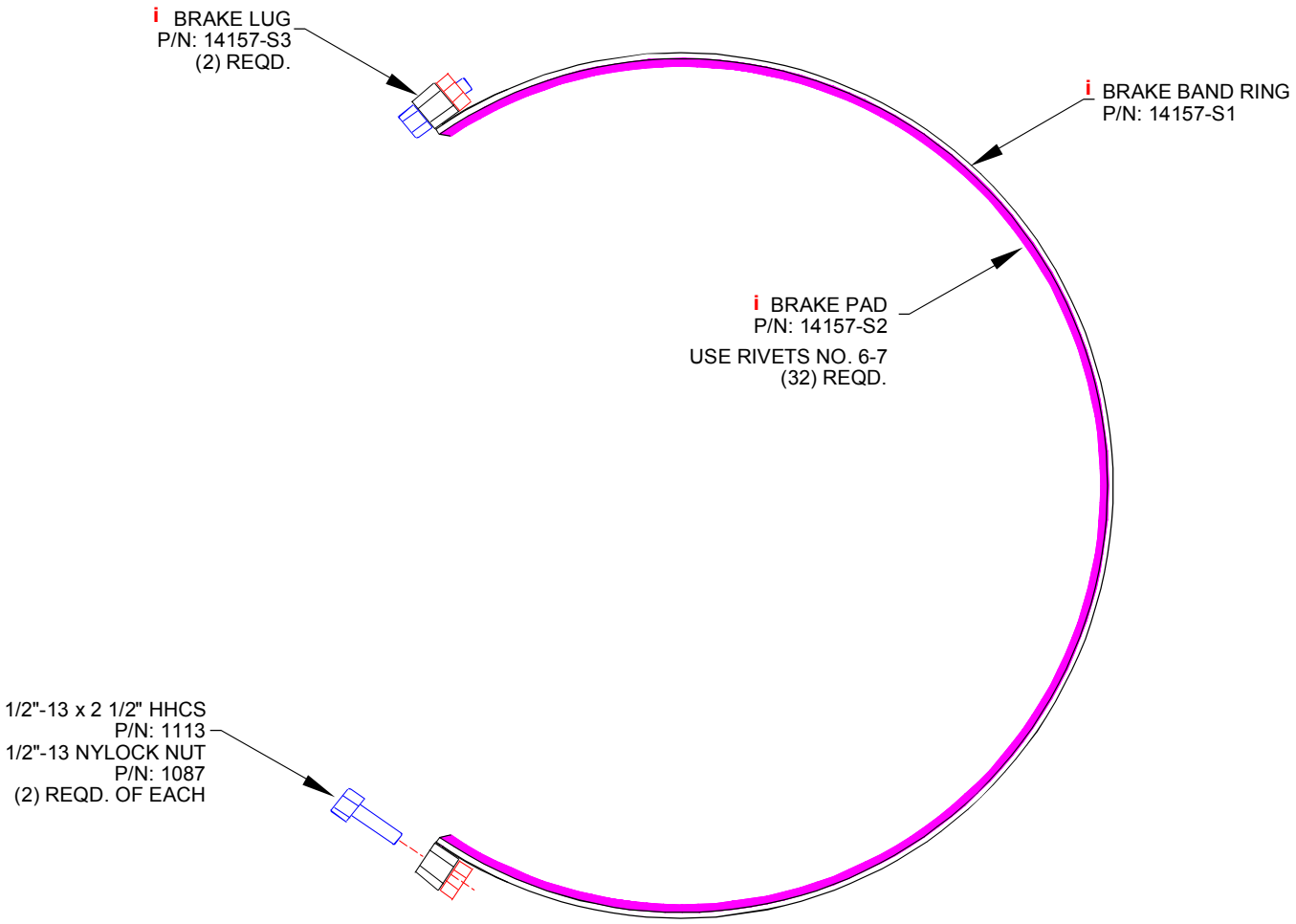
REV. #	LOG #	DATE
		12/10/04

REF: S:\Equip Manuals-Dwgs\CLE14000-08\Bottom View.wpg



BRAKE BAND ASSEMBLY

BRAKE BAND WELDMENT NO. 14157 i

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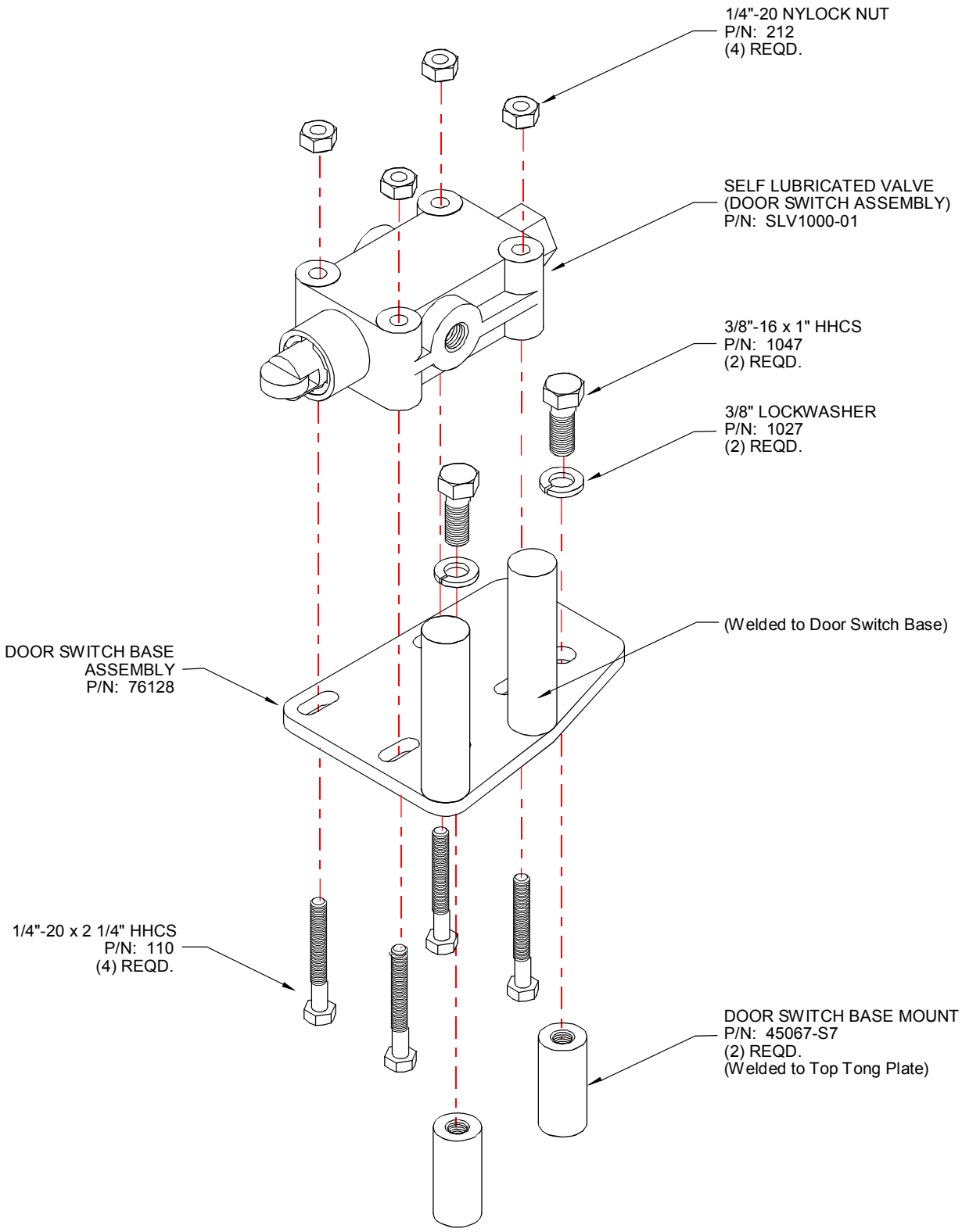
1		12/13/04
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\CLE14000-10\Brake Band rev1.wpg



DOOR SWITCH ASSEMBLY

ASSEMBLY NO. 14186

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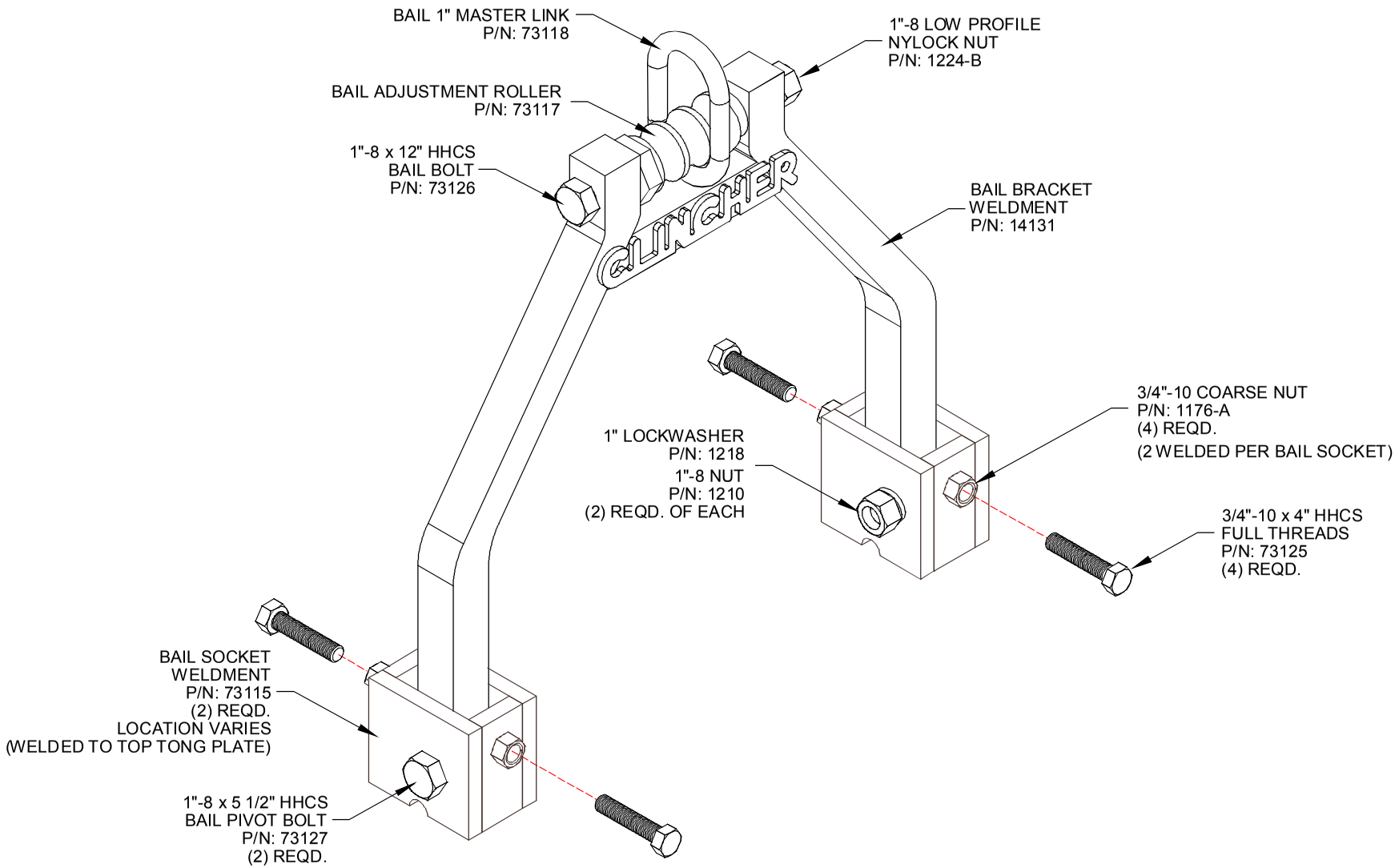
REV. #	LOG #	DATE
		11/04/04

REF: S:\Equip Manuals-Dwgs\CLE14000-10\Door Switch.wpg



BAIL ASSEMBLY

ASSEMBLY NUMBER 14130

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		07/03/03
REV. #	LOG #	DATE

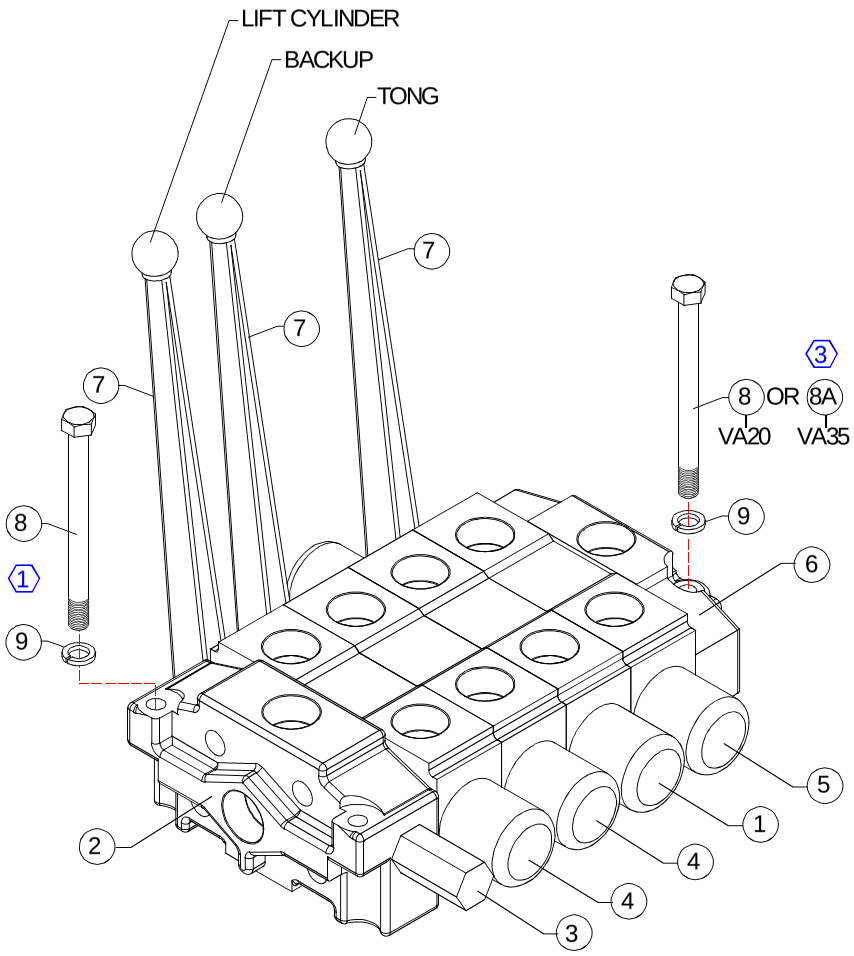
REF: S:\Equip Manuals-Dwgs\CLE14000-05\Bail Assy.wpg

A20 VALVE BANK ASSEMBLY

Item #	Qty.	Part Number	Description
1	1	55201	CONTROL VALVE ASSEMBLY - MODIFIED VA20-WDA3
			BEFORE 04/15/04
2 OR	1	VA20-MOD	WORK SECTION
			AFTER 04/15/04
2	1	VA20-AA440	INLET VALVE W/O RELIEF
3	1	VA20-MRV-1	RELIEF CARTRIDGE
4	2	VA20-DA3	WORK SECTION
5	1	VA20-MA3	WORK SECTION
6	1	VA20-TR44	OUTLET SECTION
7	3	A20-V1526K-8	A20 8" HANDLE
1 8	3	1072	HHCS 3/8"-16 x 3 3/4" (COMPONENT OF KIT P/N: 4 BANK)
1 9	3	134	LOCKWASHER 3/8" (COMPONENT OF KIT P/N: 4 BANK)

A35 VALVE BANK ASSEMBLY

Item #	Qty.	Part Number	Description
1	1	14213	CONTROL VALVE ASSEMBLY - MODIFIED VA35-WDA4
			BEFORE 04/15/04
2 OR	1	VA35-MOD	WORK SECTION
			AFTER 04/15/04
2	1	VA35-AA440	INLET VALVE W/O RELIEF
3	1	DVG35-HMRV 4	RELIEF CARTRIDGE
4	2	VA35-DA4	WORK SECTION
5	1	VA35-MA4	WORK SECTION
6	1	VA35-TR55	OUTLET SECTION
7	3	A35-V1526K-8	A35 8" HANDLE
1 8	2	X2-40 3	HHCS 1/2"-13 x 4 1/4" 3
3 8A	1	X2-45	HHCS 1/2"-13 x 4 1/2"
1 9 3	3	1103	LOCKWASHER 1/2"



VALVE BANK ASSEMBLY

Rev.	Date	Description
4	08/19/05	Item 3 - Chg.PN from A35-MRV-1 to DVG35-HMRV; ECN#05-0064.
3	12/13/04	Item 8 - Chg. Length from 5" to 4 1/4", PN from X2-79 to X2-40.
		Item 8A - Added Part. Item 9 - Chg. Qty. from 2 to 3.
2	10/21/04	Item 1 - Added VA20-MOD & VA35-MOD for Production after 04/15/04.
1	06/10/02	Item 8 & 9 - Added Part.

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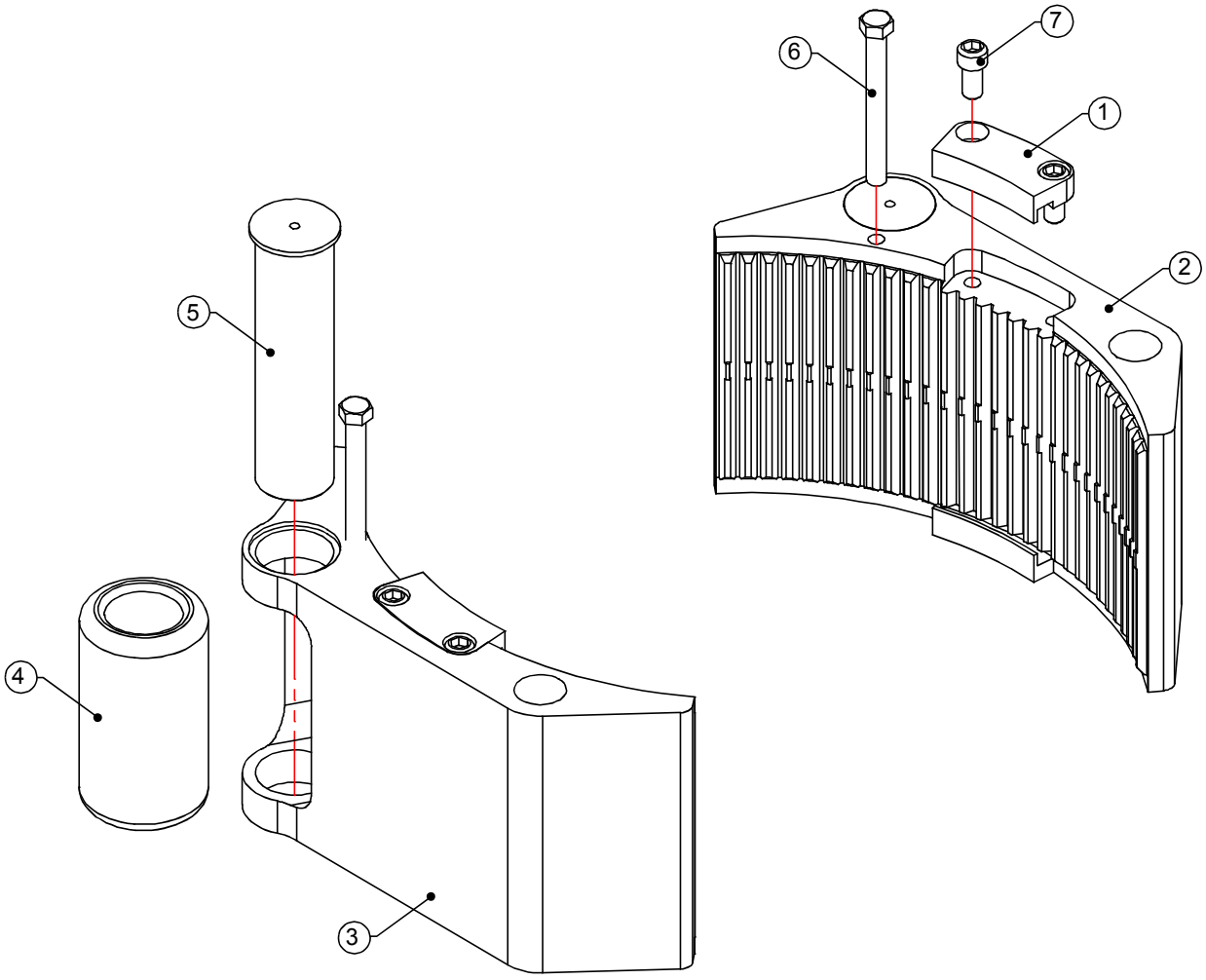
REV. #	LOG #	DATE
4		08/19/05

REF: S:\Equip Manuals\Dwgs\Valve Bank 4 rev4.wpg

Item	Qty.	Part Number	Part Name
1	4	14618	JAW CLIP
2	1	14619L	14" x 14" LEFT SPLINED JAW
3	1	14619R	14" x 14" RIGHT SPLINED JAW
4	2	14059-01	JAW ROLLER
5	2	76013-01	JAW PIN
6	2	1071	3/8"-16 x 3 1/2" HHCS
7	8	1040-A	3/8"-16 x 3/4" SHCS



USES:
FINE TOOTH STEEL DIES
P/N: CLE1400-XXXX
GRIT FACE™ DIES
P/N: BB1400-XXXX

14" x 14" SPLINED JAW SET ASSEMBLY

ASSEMBLY NO. CJ-14A

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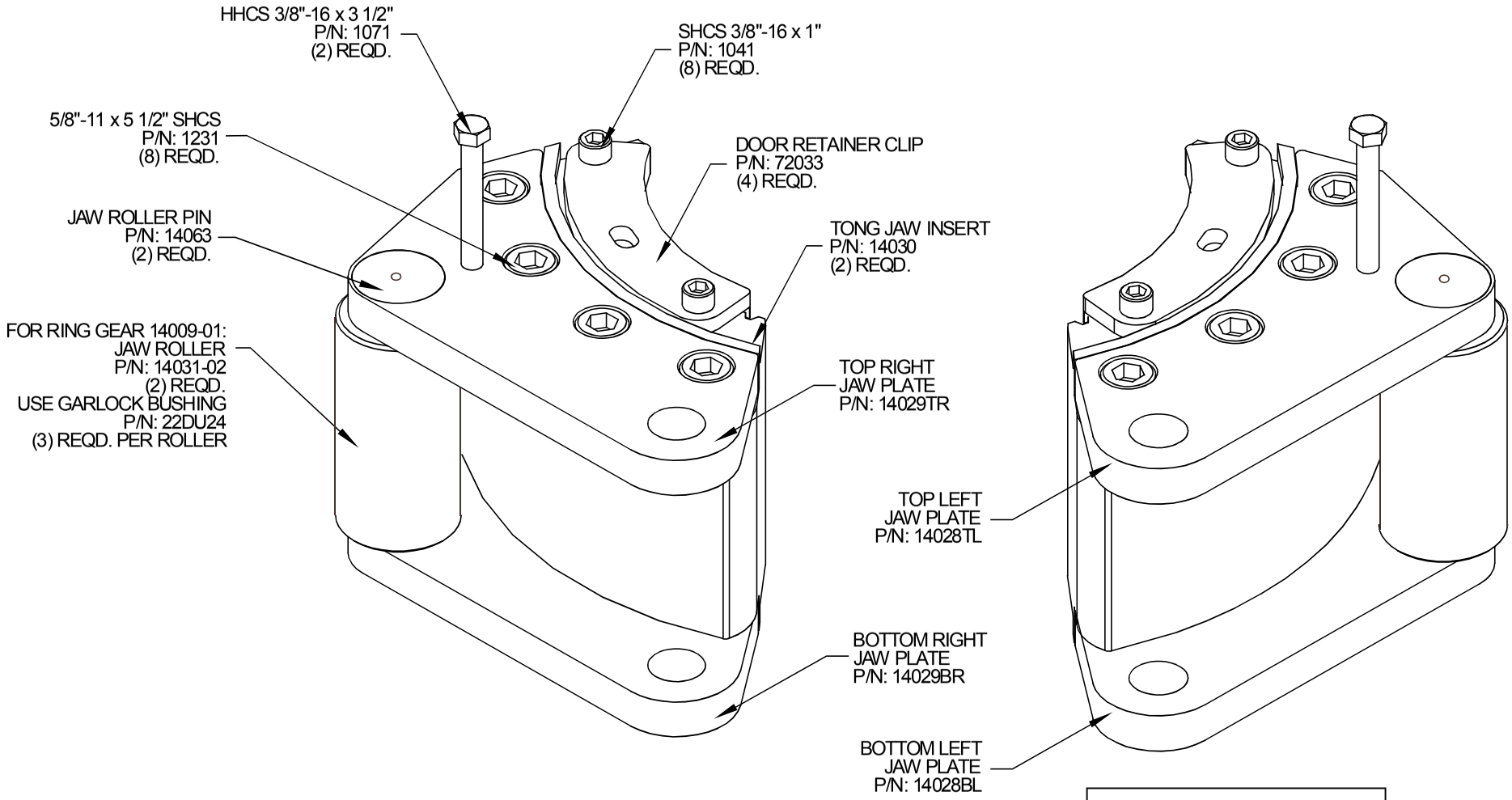
REV. #	LOG #	02/06/06 DATE

REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000\Jaw CJ-14A.wpg



USES:
FINE TOOTH STEEL DIES
P/N: BUC7625-XXXX
GRIT FACE™ DIES
P/N: BB7625-XXXX

14" x 4 1/2" - 7 5/8" LOW FRICTION TONG JAW ASSEMBLY

Assembly Number: CJ-LF-14A

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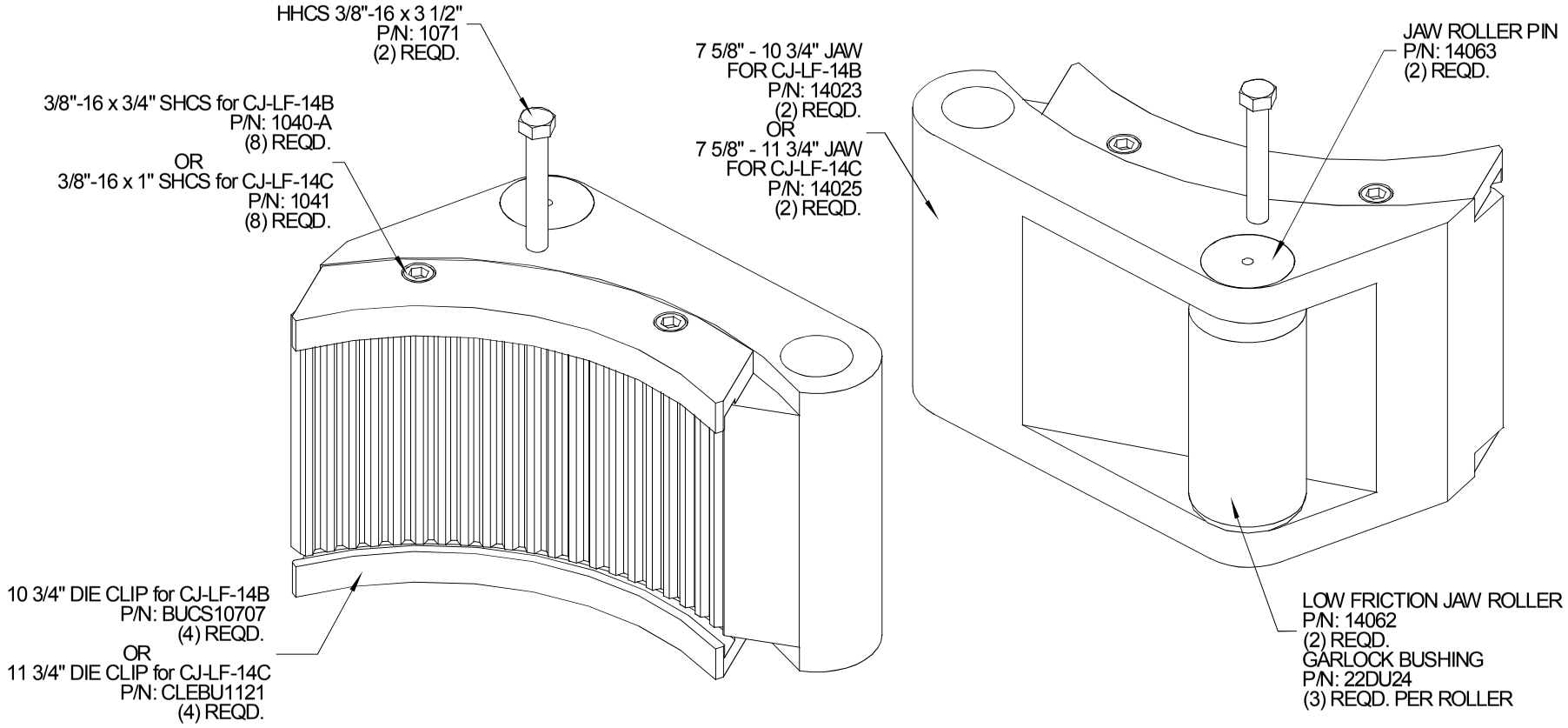
REV. #	LOG #	DATE
1		02/06/06

REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000-05\Jaw LF-14A rev1.wpg



CJ-LF-14B USES:
FINE TOOTH STEEL DIES
P/N: BUCM1075-XXXX
GRIT FACE™ DIES
P/N: BB1075-XXXX

CJ-LF-14C USES:
FINE TOOTH STEEL DIES
P/N: CLEBU1175-XXXX
GRIT FACE™ DIES
P/N: BB1175-XXXX

14" TONG LOW FRICTION JAW SET ASSEMBLY

7 5/8" - 10 3/4" Assembly Number CJ-LF-14B
7 5/8" - 11 3/4" Assembly Number CJ-LF-14C

(Right & Left Jaw are reversible and interchangeable)

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4		02/06/06
REV. #	LOG #	DATE

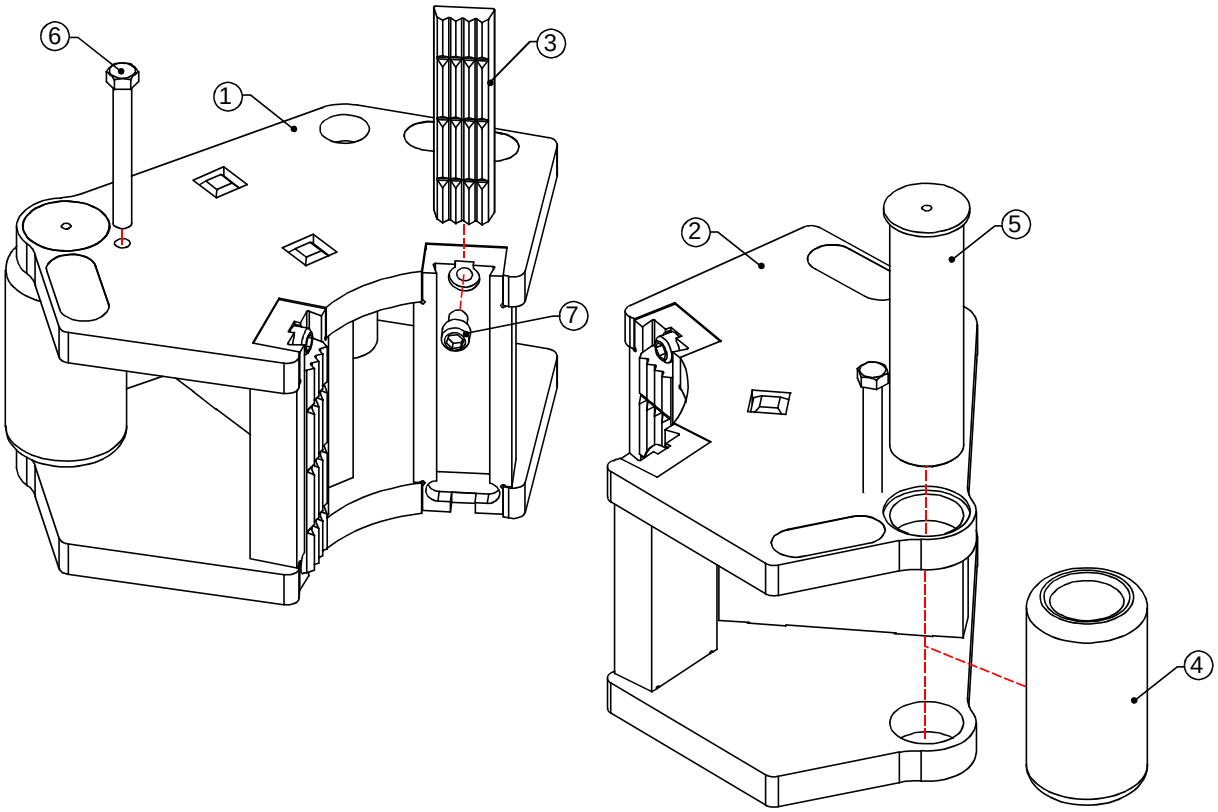
REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000\Jaw LF-14B&C rev4.wpg

Size	Jaw Set Assembly Number	Left Jaw Weldment Part Number	Right Jaw Weldment Part Number
5"	CJDT14H05000	14H05000L	14H05000R
5 1/2"	CJDT14H05500	14H05500L	14H05500R
6 5/8"	CJDT14H06625	14H06625L	14H06625R
7	CJDT14H07000	14H07000L	14H07000R
7 5/8"	CJDT14H07625	14H07625L	14H07625R
8 5/8"	CJDT14H08625	14H08625L	14H08625R
9 5/8"	CJDT14H09625	14H09625L	14H09625R
9 7/8"	CJDT14H09875	14H09875L	14H09875R
10 5/8"	CJDT14H10625	14H10625L	14H10625R
10 3/4"	CJDT14H10750	14H10750L	14H10750R
11 3/4"	CJDT14H11750	14H11750L	14H11750R
12 3/4"	CJDT14H12750	14H12750L	14H12750R

Item	Qty.	Part Number	Part Name
1	1	SEE CHART	LEFT JAW WELDMENT
2	1	SEE CHART	RIGHT JAW WELDMENT
3	4	DTI1602	1/2" T x 1 1/4"W x 5" L STRIP DIE
4	2	14059-01	JAW ROLLER
5	2	76013-01	JAW PIN
6	2	1071	3/8"-16 x 3 1/2" HHCS
7	4	234	3/8"-16 x 1/2" SHCS

MANUFACTURE BEFORE 10/2004, USED:

4	1061	3/8"-16 x 3/4" BUTTON HD CS
4	1027	3/8" LOCKWASHER



5" THRU 12 3/4"
DOVETAIL JAW ASSEMBLY

SEE CHART FOR ASSEMBLY NUMBERS

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REV. #	LOG #	DATE
3		02/06/06

REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000-05\Jaw DT5-1275 rev3.wpg

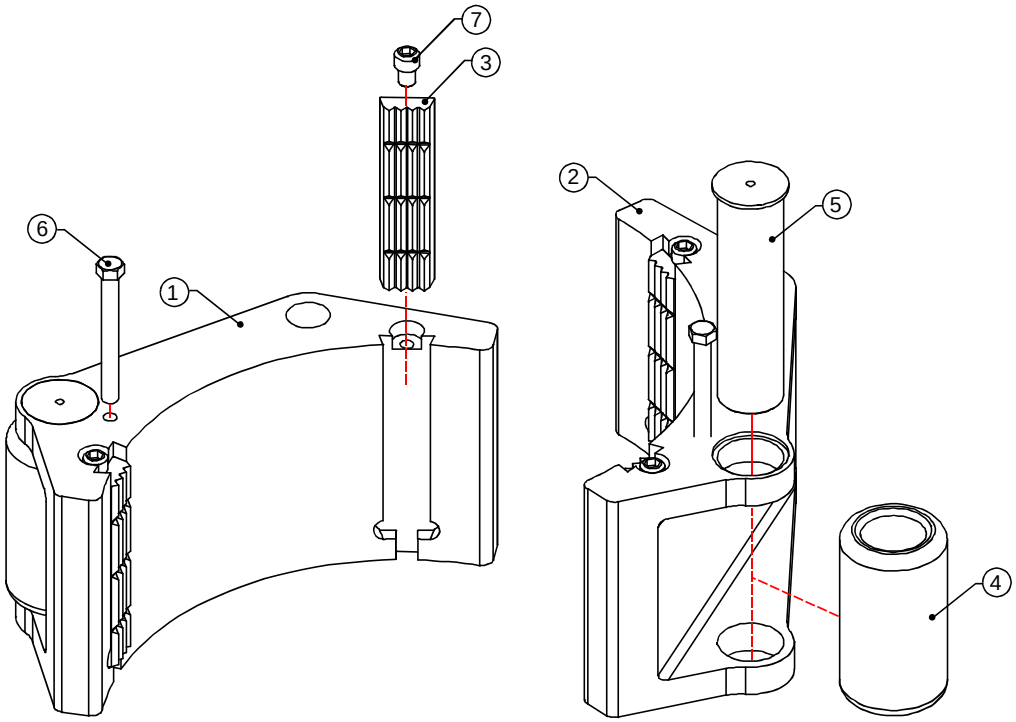
Size	Jaw Set Assembly Number	Left Jaw Weldment Part Number	Right Jaw Weldment Part Number
13 3/8"	CJDT14H13375	14H13375L	14H13375R
13 5/8"	CJDT14H13625	14H13625L	14H13625R
14"	CJDT14H14000	14H14000L	14H14000R
★ 14 3/8"	CJDT14H14375	14H14375L	14H14375R

★ **ONLY FOR 14" TONG MODELS THAT HAVE 14 3/8" CAGE PLATE OPENING.**

Item	Qty.	Part Number	Part Name
1	1	SEE CHART	LEFT JAW WELDMENT
2	1	SEE CHART	RIGHT JAW WELDMENT
3	4	DTI1602	1/2" T x 1 1/4" W x 5" L STRIP DIE
4	2	14059-01	JAW ROLLER
5	2	76013-01	JAW PIN
6	2	1071	3/8"-16 x 3 1/2" HHCS
7	4	234	3/8"-16 x 1/2" SHCS

MANUFACTURE BEFORE 10/2004, USED:

4	1061	3/8"-16 x 3/4" BUTTON HD CS
4	1027	3/8" LOCKWASHER



13 3/8" THRU 14 3/8"
DOVETAIL JAW ASSEMBLY

SEE CHART FOR ASSEMBLY NUMBERS

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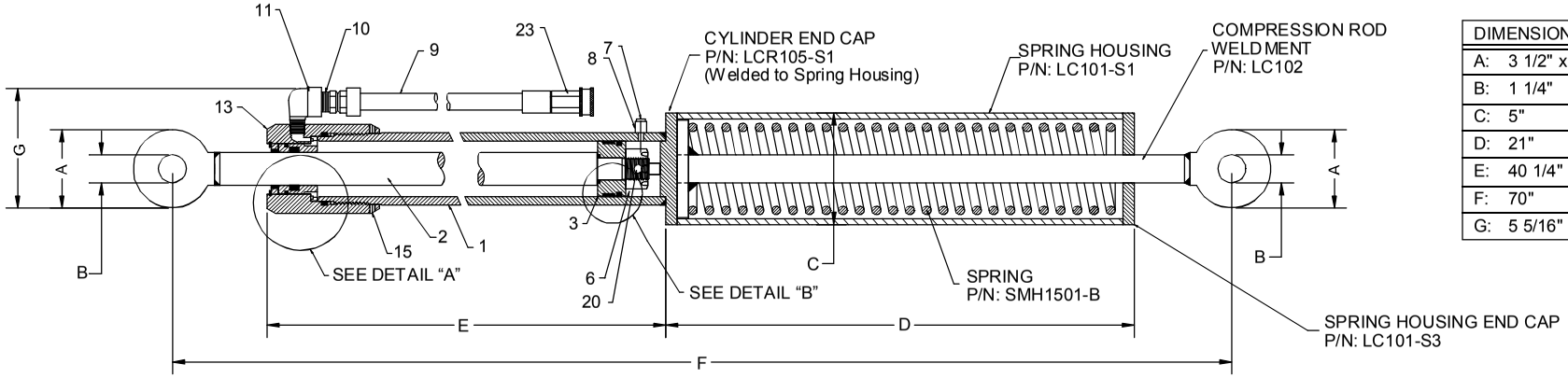
REV. #	LOG #	DATE
1		02/14/06

REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000-05\Jaw DT 13375-14375 rev1.wpg

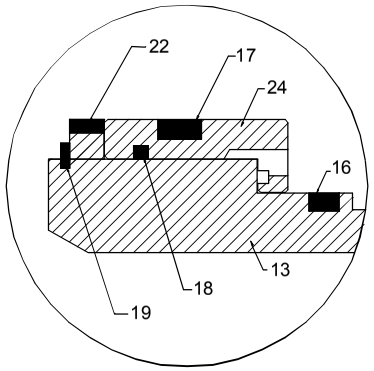


DIMENSIONAL DATA
A: 3 1/2" x 3/4"
B: 1 1/4"
C: 5"
D: 21"
E: 40 1/4"
F: 70"
G: 5 5/16"

i SEAL KIT P/N: ASAP100

BILL OF MATERIALS

	Item	Qty.	Description	P/N
	1	1	HYD/AIR CYLINDER BARREL	LCR105
	2	1	CYLINDER ROD WELDMENT	LCR112
	3	1	PISTON	LCR106
i	4	1	WEARBAND	W25000500
i	5	1	POLYPACK 2 1/8" x 2 1/2" x 3/16"	18702125
	6	1	1"-12 SLOTTED HEX NUT	1209
	7	1	1/2" FLUSH PLUG W/ 1/8" ORIFICE	1657
	8	1	1/2" HALF COLLAR	1380
	9	1	1/2" x 120" HOSE ASSY. MNPT x FJIC SWVL	LCR107-A
	10	1	3/8" MNPT x 1/2" MJIC ADAPTER	1466
	11	1	3/8" STREET EL W/ORIFICE	LCR109
	12	---	----------	----------
	13	1	GLAND CAP	LCR119
	14	---	----------	----------
	15	2	1/4"-20 x 3/8" SET SCREW	1015
i	16	1	O RING 2 7/8"ID, 3 1/4"OD, 3/16"W	2-336
i	17	1	POLYPACK 1 1/2" x 1 7/8" x 3/8"	18701500-375
i	18	1	O RING 2"ID, 2 1/4"OD, 1/8"W	2-226
	19	1	INTERNAL SNAP RING (N-1300-225)	1947
	20	1	1/4" x 1 1/2" ROLL PIN	1008-A
i	21	1	O RING 1"ID, 1 1/4"OD, 1/8"W	2-214
i	22	1	SEAL NP CR14938	CR14938
	23	1	QUICK DISCONNECT 1/2" FEMALE SNAPTITE	1430
	24	1	GLAND	LCR113



DETAIL "A"
SCALE: 3X

SPECIFICATIONS - B

MAXIMUM SPRING TRAVEL (PRELOAD TO SOLID) ..... 5.510 in.

MAXIMUM ALLOWABLE LOAD (SPRING FULLY COMPRESSED) ..... 2.854 lbs.

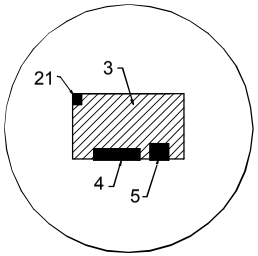
PRESSURE REQUIRED TO LIFT MAXIMUM ALLOWABLE LOAD ..... 909 psi

MAXIMUM ALLOWABLE INTERNAL PRESSURE ..... 3,000 psi

CYLINDER I.D. ..... 2.50 in.

ROD O.D. ..... 1.50 in.

STROKE ..... 34.94 in.



DETAIL "B"
SCALE: 3X

LIFT CYLINDER ASSEMBLY

ASSEMBLY NUMBER LCR100-B

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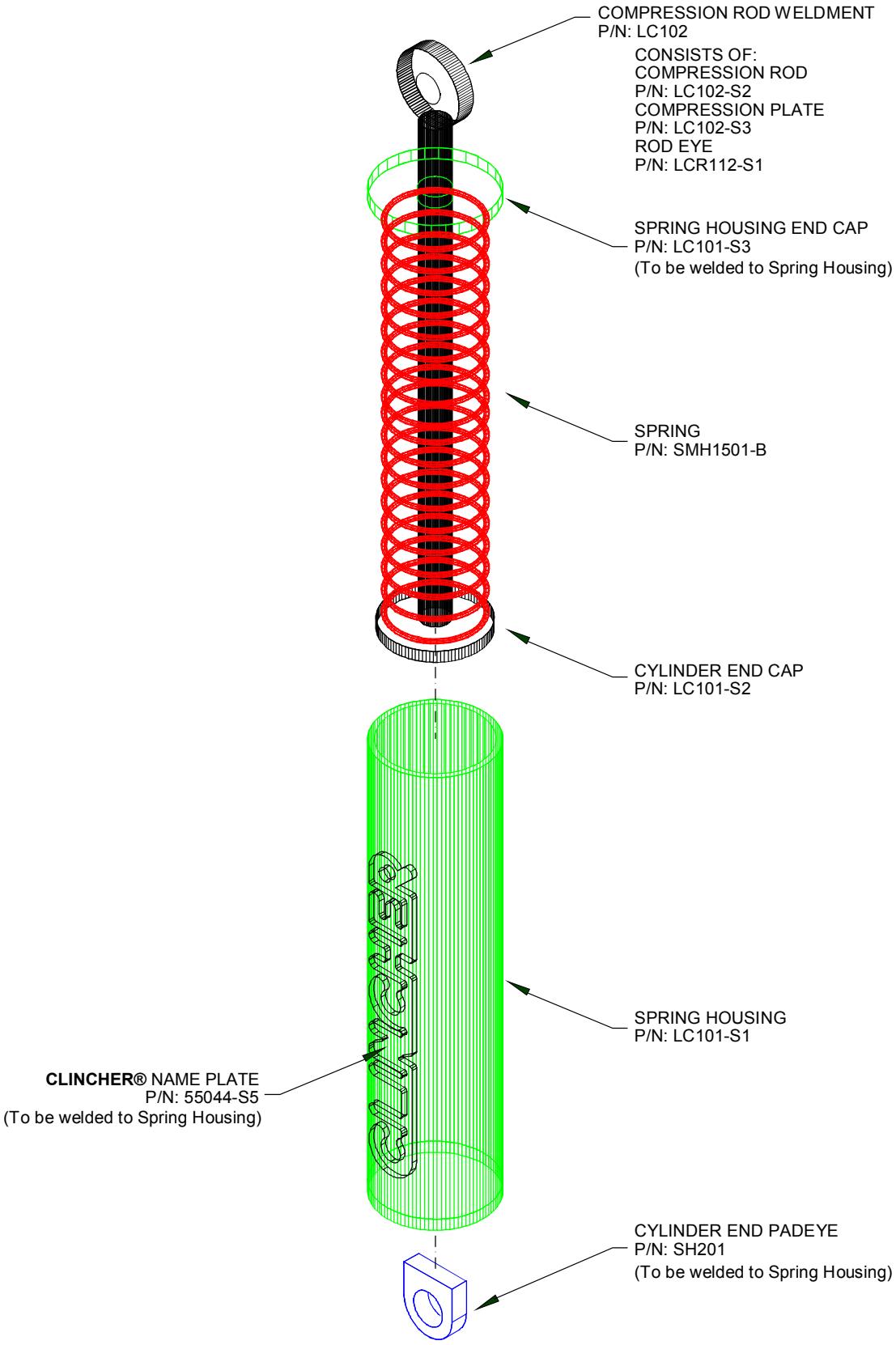
REV. #	LOG #	DATE
1		04/19/02

REF: S:\Equip Manuals\Dwgs\LCR\LCR100-B rev1.wpg



SPRING HANGER

ASSEMBLY NO. SH200

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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CLINCHER® LOADCELL and TORQUE GAUGE ASSEMBLIES

The **CLINCHER®** Tong is available in versions which accommodate compression loadcells or tension style loadcells.

Part Number	SM50-40T
Torque Rating	50,000 ft lbs
Handle Length	40 inches
Loadcell Type	Tension
Loadcell Manufacturer	SUPERIOR MANUFACTURING & HYDRAULICS
Torque Gauge Mfr.	TOTCO or equivalent
Torque Gauge Size	6"
Gauge Mount	"L" Bracket
Hose Length	6 feet
Assembly Documentation	Calibration Certificate

CLINCHER® Load cells and Torque Gauges are produced by several manufacturers. The information provided by MD TOTCO or Acadiana Oilfield Instruments may not be applicable to all torque gauges or load cells. This reference information is provided with the permission of MD TOTCO and Acadiana Oilfield Instruments.

CLINCHER® LOADCELL and TORQUE GAUGE ASSEMBLIES

To request copy of Acadiana Oilfield Instruments Technical Manual TM518, please contact:

Superior Manufacturing & Hydraulics
4225 Hwy. 90 East
Broussard, LA 70518
Phone: 337-837-8847
Fax: 337-837-8839
www.superior-manf.com

SECTION 12 MOTOR SERVICE MANUALS

To request copy of Rineer Motor Service Manuals, please contact:

Superior Manufacturing & Hydraulics
4225 Hwy. 90 East
Broussard, LA 70518
Phone: 337-837-8847
Fax: 337-837-8839
www.superior-manf.com

SECTION 13 VALVE TECHNICAL DATA

To request copy of Valve Technical Data, please contact:

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Fax: 337-837-8839
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